2.5.1. The mechanism of internal assessment is transparent and robust in terms of frequency and mode.

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY
*Established by Government of Central Provinces Education Department by Notification No. 513 dated the 1st of August, 1923 & presently a State University governed by Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017)

DIRECTION NO. 11 OF 2020

ADMISSIONS AND EXAMINATIONS LEADING TO THE AWARD OF THE DEGREE OF BACHELOR OF ARTS (SEMESTER PATTERN)(THREE YEAR DEGREE COURSE)DIRECTION, 2020.

Whereas, Maharashtra Public Universities Act, 2016 (VI of 2017) (hereinafter the Act) has come into force from 1st March 2017;

AND

Whereas, the University has issued Direction No.15 of 2017 dealing with the composition of the four faculties created by the Act, where under the existing different faculties of the University have been merged into the four new faculties created by the Act, by which the erstwhile independent faculties of "Arts" and "Social Sciences" have been merged in the new faculty of "Humanities" under the Act;

AND

Whereas, the University Grants Commission, New Delhi vide letter No.D.O.No.F-1-2/2008 (XI Plan) dated 31stJanuary 2008 regarding new initiatives under the XIth Plan-Academic Reforms in the University has suggested for improving quality of higher education and to initiate the Academic Reforms at the earliest,

AND

Whereas, the Special Task Committees under the erstwhile faculties of Arts and Social Sciences in their meetings held during 02nd March 2016 to 16th May 2016, prepared the syllabi and scheme of examination for the Bachelor of Arts, Semester Pattern (Three Year Degree Course) in the erstwhile Faculties of Arts and Social Science and recommended to the Hon'ble Vice-Chancellor for starting the said course from the academic session 2016-17;

AND

Whereas, the Hon'ble Vice Chancellor of RashtrasantTukadojiMaharaj Nagpur University, Nagpur in exercise of his powers under 14(7) of the Maharashtra University Act, 1994 (since repealed by the Act VI of 2017) has considered, accepted and recommended to the Academic Council, on behalf of the Board of Studies under the Faculties of Arts and Social Science, the policy decision regarding introduction of Bachelor of Arts, Semester Pattern

, course, it's syllabi along with the draft Direction and the scheme of examination for semesters-I to VI;

AND

Whereas, the Academic Council in its meeting held on 08th June, 2016 vide item No. 1(B) & 4 (B) has considered, accepted and recommended to Management Council, for Bachelor of Arts (Three Year Degree Course) in the Faculty of Arts & Social Science, Semester Pattern syllabi with draft direction and the Scheme of examination of Semester-I to VI

AND

Whereas, the Management Council in its meeting held on 14th June, 2016 vide item No. 96 (B)& 99(B), has considered, accepted the course of Bachelor of Arts, semester pattern (Three Year Degree Course) in the erstwhile Faculties of Arts & Social Science, semester pattern syllabi with draft Direction and scheme of examination of Semester-I to VI;

AND

Whereas, Direction No. 12 of 2016, introducing the semester pattern Bachelor of Arts (Three Year Degree Course) from the Academic Session 2016-17 had been issued by the University;

AND

Whereas, the University has issued Direction No. 13 of 2017 prescribing "conditions for conduct of undergraduate and post graduate examinations based on credit based/choice based credit system, in all faculties, Direction, 2017" on 06/06/2017, prescribing certain conditions relating to maximum and minimum passing marks in the theory /practical subjects prescribed in the semester of a course, the maximum theory and practical subjects in a semester, rules of exemption and ATKT, and also the coding pattern for the subjects in each semester of the course;

AND

Whereas, provision for Additional B. A. on the lines prescribed in Ordinance No. 146/1997, since repealed, has been provided vide the decision of the Vice-Chancellor taken under section 12(7) of the Act, on behalf of the faculty of Humanities, on 05-01-2019 and the same were incorporated in the Direction no. 04 of 2019;

AND

Whereas, Direction No. 04 of 2019 replacing Direction No. 27 of 2017 and incorporating the appropriate provisions was issued by the University but the same has lapsed by virtue of the provision of proviso to section 12(8) of the Act necessitating issuance of a new Direction incorporating the provisions of Direction 04 of 2019, since lapsed;

Now, therefore,I , Dr. Subhash R. Chaudhari, in exercise of my powers under section 12(8) of the Act, do hereby issue the following Direction;

1. This Direction may be called "**Admissions and Examinations leading to the award of the Degree of Bachelor of Arts (Semester Pattern)(Three Year Degree Course) Direction, 2020**"

2. The Direction shall come into force from the date of its issuance and will be applicable to all the students taking admissions in the 1st& 2nd semesters, 3rd&4thsemesters of the Bachelor of Arts, (semester pattern) (three year degree course)and also the students admitted for the Additional B. A. courseduring the academic session 2018-2019 and onward.

3. The duration of the B.A. course shall be of three academic years consisting of six semesters with the University examinations at the end of each semester namely:

   a) B.A. Semester I Exam
   b) B.A. Semester II Exam
   c) B.A. Semester III Exam
   d) B.A. Semester IV Exam
   e) B.A. Semester V Exam
   f) B.A. Semester VI Exam

4. The theory examinations of semesters-I, II, III, IV, V and VI shall be conducted by the University and shall be held separately at the end of each semester at such places and dates as may be decided and notified by the University and shall be held as per the schedule given in the Table below.

Sr. No.	Name of the examination	Regular Students, Ex And External Students Examination	External Students and Supplementary Students Examination
1	Semester I, III & V	Winter	Summer
2	Semester II, IV & VI	Summer	Winter

5. **ELIGIBILITY TO THE COURSE:**

In order to be eligible for admission to the 1stsemester of Bachelor of Arts, Semester Pattern (Three Year Degree) course, the applicant should have passed the 12th standard examination of the Maharashtra State Board of Secondary and Higher Secondary Education in the Faculty of Arts or Faculty of Commerce or Faculty of Science, Vocational Stream, Professional Courses or any other 10+2 examination with English as one of the compulsory subject. Where,

however, the applicant has passed the 12th standard examination without English as the compulsory paper such applicant shall have to obtain the eligibility certificate from the University.

6. ELIGIBILITY FOR ADMISSION IN EXAMINATION:-

Subject to compliance with the provisions of this Direction and of other ordinances in force from time to time, the following persons shall be eligible for admission to the examination:-

(a) A student who has prosecuted a regular course of study for not less than six months prior to that examination;

(b) A teacher in an educational institution eligible under the provisions of Ordinance No. 18;

(c) An external student.

Provided that in the case of the candidates eligible under clause (b) and (C) above the candidate shall have attended a course of laboratory instructions by obtaining casual admission in a college for the subject in which laboratory work is prescribed. Such a candidate shall submit a certificate to that effect signed by the Principal of the college.

(d) For external candidate the internal mark of a subject/paper shall be awarded in proportion to the marks secured by him/her in the University examination in the theory or practical subject/paper.

7. **ATKT Rules:-** Only the students who have taken admission as regular students are eligible for the benefits of the ATKT rules hereunder. Thus the external students and the students appearing in examinations under para 6 (b) above and para 21 hereinafter are not eligible for the benefit of the ATKT rules.

The ATKT rules for admission in higher semesters of the B.A. (Semester Pattern) course shall be as given in following table:

	Admission to Semester	**The student should have attended the session satisfactorily and appeared for the examination.**	**Candidate should have passed in at least 50% of the passing heads of the examinations, fraction , if any, to be ignored (Theory and Practical being separate passing heads.)**

A	B.A.I[st] Semester	----------	----------
B	B.A.II[nd]Semester	B.A. Ist semester	----------
C	B.A.III[rd] Semester	B.A. IInd semester	Semester I and Semester II examinations taken together.
D	B.A.IVth Semester	B.A. IIIrd semester	----------
E	B.A.V[th] Semester	B.A. IV semester	a) Should have passed the examinations of semester I and semester II, And b) 50% of the total number of heads prescribed for semester III and semester IV examinations.
F	B.A.VI[th] Semester	B.A. V semester	----------

8) a) Without prejudice to other provisions of Ordinance no. 6 relating to theexamination in general, provisions of Para 5, 8, 10 and 31 of the said ordinance shall apply to every student admitted to this course.

b) The students admitted to this Degree Course shall be governed by the general Ordinances/ Directions of the University which are applicable to all the regular, external and ex-students. These ordinances include complete as well as relevant provision of Ordinance No. 1, 2, 6, 7-A, 9, 10, 19, 109, ordinance No. 30 of 2006, (Amended Ordinance No. 4 of 2006), Direction 9 of 2008, Direction 5 of 2004, wherever applicable.

9) The fee for the course including the tuition, examination, laboratory and other fees shall be as prescribed by the university from time to time.

10) Students can opt following papers for the B.A. Semester I to VI as per the details given below:-

Paper -I Code-1T1	Compulsory English	Compulsory subject	Compulsory
Paper –II Code-1T2	Second Language: Marathi, Hindi, Urdu, Supplementary English, Gujrati, Bengali, Telugu, Sanskrit, French, German,Russian, Persian, Arabic, Pali and Prakrit or Latin	Any one of these languages	Compulsory
Paper –III to V Code-1T3 to 1T5	Marathi Literature, Hindi Literature Urdu Literature, Gujrati Literature, Bengali Literature, Telugu Literature, French Literature, German Literature, Russian Literature Persian Literature, Arabic Literature, Pali and Prakrit Literature, Latin Literature, Sanskrit Literature Communicative English, Functional English, English Literature, Functional Hindi, Music, History, Economics, Political Science, Sociology, Philosophy, Psychology, Geography, Home Economics, Dr. Ambedkar Thoughts, Public Administration, Buddhist Studies, Ancient Indian History Culture & Archaeology, Gandhian Thoughts , Fashion Design, Military Science, Mathematics and Statistics.	Any Three from these subjects	Optional

Note: The coding of the subjects in the semester II onward shall be on the lines of the coding in the first semester. Thus the theory papers in semester II shall be coded as 2T1 to 2T5 and so on. In case of the practical subject the same shall be coded as 1P1, 1P2 or 2P1,2P2 or 3P1,3P2 and so on depending upon the semester.

11) The five subject offered by the students at semester I level will remain unchanged till the final semester.

12) (a) The scope of the subjects shall be as prescribed in the syllabus.

(b) The medium of instruction and examination shall be English, Hindi, Marathi, except for the courses in Languages and Literature.

13) The maximum marks assigned to each paper and minimum marks, an examinee must obtain in order to pass the examination shall be as per clause 25 herein.

14) The practical examination of all semester will be conducted at the end of each semester as indicated in the table given below:

Sr. No.	Name of the examination	Main Examination	Supplementary Examination
1	Semester I; III & V	Winter	Summer
2	Semester II, IV & VI	Summer	Winter

15) The scheme of awarding internal marks shall as per clause 26 of this Direction.

16) Successful examinees at the B.A. Sem-VI Examination who obtained not less than 60% marks (aggregate of Sem- I, II, III, IV, V and VI Examinations taken together) shall be placed in first division, those obtaining less than 60% but not less than 45% in second Division, and all other successful examinees below 45% in third division.

17) There shall be no classification of successful candidates at Sem- I to Sem-V Examination.The division of the successful candidate shall be declared at the end six semester taking in to consideration the score of all six semesters.

18) An examinee successful in the minimum period prescribed for the examination, obtaining not less than 75% of the maximum marks prescribed in the subject shall be declared to have passed the examination with Distinction at that subject. Distinction shall not be awarded to an examinee availing of the provision of the exemptions and compartments at any of the examination.

19) Provisions of Ordinance No, 7-A relating to the condonation of Deficiency of Marks for passing an examination and compartment as amended updated vide ordinance No. 45 of 1983 shall apply to the examinations under this Direction.

20) The names of the successful examinee passing the examination as a whole in the minimum prescribed period and securing the grades

equivalent to first and second division shall be arranged in order of merit as provided in ordinance 6 relating to examination in general.

21) No candidate shall be admitted to an examination under this Direction, if he / she has already passed the same examination of this university or of any other university. However, any person who has passed Final B.A. examination under this Direction or any earlier Ordinances/Direction of this University or any of the First Degree Examination of this University or of any other Statutory University may on payment of the fee prescribed by the University, from time to time, be admitted to subsequent examination in one or more optional subject/s not offered by him/her in earlier examination, without being required to prosecute regular course of studies in the subject/s in a college. Such an examinee will be required to take simultaneously all the examinations of the six semesters leading to the Degree of Bachelor of Arts in subject/s and on securing not less than the minimum passing marks prescribed for the subject/s shall be issued a certificate of having passed examination in the Additional subject/s as the case may be.

22) Successful examinees at the B.A. Semester I, II, III, IV, V and VI Examinations shall be entitled to receive a Certificate signed by the Director, Board of Examinations & Evaluation of University (DBE&E) and successful examinees at the end of B.A. Semester VI examination shall, on payment of prescribed fees, receive a Degree in the prescribed format, signed by the Vice-Chancellor.

23) The provisions of Direction No. 3 of 2007 for the award of grace marks for passing an examination, securing higher grade in subject(s) as updated from time to time shall apply to the examination under this direction.

24) **Absorption scheme** for failure students of the Annual pattern:

a) All the students of the annual pattern who failed to complete the course within the time given i.e. till Summer 2019, will have to switch over to the semester pattern course under this Direction by taking fresh admission.

b) The students of the annual pattern who have passed the first year annual pattern, as per annual pattern, shall get admission to the IIIrd semester.

c) The students who have passed the first year and the second year of the annual pattern shall be admitted to the Vth semester.

d) The final semester mark sheet of the students who are absorbed under clauses (b) and (c) shall be prepared by converting their total marks in to out of 3000 marks.

e) The candidates of old course (Yearly Pattern) who had become eligible to the second year or third year under the ATKT Rules

shall be permitted to appear for higher class (Semester III or V) as per the new course (Semester Pattern) examination of the Bachelor of Arts programme (Semester Pattern) provided they submit eligibility certificate (as per Proforma given below) from the Principal of the College stating that he/she has satisfactorily undergone a course of study.

ELIGIBILITY CERTIFICATE

(For getting admission for Semester III or Semester V of Degree Course)

Name of the Previous Examination _____ Year _____

This is to certify that this Shri / Shrimati / Kumari _____ _____ is eligible

to get the admission for _____ of B.A. Degree Course.

Name and signature of the Principal
Name of the College

Dated ___ / ___ / _____

SEAL

25. **Teaching & examination scheme Bachelor of Arts, Semester Pattern (Three Year Degree Course)**
B.A. (Semester I, II, III, IV, V, VI)

Subject	Teaching Scheme				Maximum Theory /Practical and Internal Assessment Marks				
	Th	Tu	Prac	Total	Time Hrs	Theo Max Marks	Internal Assessment/ Prac. Marks	Total	Total Passing Marks
Compulsory English	04	01*	----	05	3	80	20	100	40
Second Languages	04	----	----	04	3	80	20	100	40

Optional Except ELT.	05	----	----	05	3	80	20	100	40
Eng. Literature	06	----	----	06	3	80	20	100	40
Practical Subjects like geography, music, etc.	04	----	01	05	3(Th) 6-8 (Prac)	40/ 40 (As per the syllabus)	10/ 10 (As per the syllabus)	50 50 (As per the syllabus)	20/ 20 (As per the syllabus)

*One tutorial period consisting of 20 students per batch for Compulsory English

26. Guidelines forInternal Assessment, Theory Paper and Practical:-

1. The internal assessment marks shall be awarded by the concerned teacher.

2. The internal assessment shall be completed by the College / University at least 15 days prior to the final examination of each semester. The Marks shall be sent to the University immediately after the assessment in the prescribed format.

3. **General guidelines for Internal Assessment are:**

   a) The internal assessment marks assigned to each theory paper shall be awarded on the basis of assignments like class test, attendance, home assignments, study tour, visit to educational institutions and research organizations, field work, group discussions or any other innovative practice / activity, as prescribed in the relevant syllabus.

   b) There shall be no separate / extra allotment of work load to the teacher concerned. He/ She shall conduct the internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.

   c) The concerned teacher / department / college shall keep the record of all the above activities until six months after the declaration of the results of that semester.

d) At the beginning of each semester, every teacher / department / college shall inform his / her students unambiguously the method he / she proposes to adopt and the scheme of marking for internal assessment, wherever the heads for award of internal marks are not specified in the syllabus of the paper.

e) The teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD / Principal.

f) Final submission of internal marks to the University shall be before the commencement of the University Theory / Practical examinations whichever is later.

27. The scope of the subjects, paper pattern for theory examination and distribution of marksshall be as prescribed by the Board of Studies of the relevant subject and as given in the syllabus.

However, broad distribution of marks for different subjects in each semester will be as under:

Subject	Theory	Internal Assessment	Practical	Internal Assessment	Total
Compulsory English.	80	20	-------		100
Second Languages.	80	20	-------		100
Optional subjects without practicals.	80	20	-------		100
Optional subjects with practicals. (Optional)	40	10	40	10	100

28. Practical Examination:- A. Each practical shall carry 40 marks. For the examination, the distribution of the marks shall be as follows:

i. Record / Journal / Internal: 10 marks – Evaluated by Internal

ii. assessment : 10 marks – Evaluated jointly by External & Internal

Practical Performance : 20 marks - Evaluated by External

iii. Viva

NOTE: 1. Practical performance shall be jointly evaluated by the external and internal examiner. In case of discrepancy, the external examiner's decision shall be final.

3. Practical examinations shall be of 3 to 8 hours duration for one or two days, depending on the subject and the number of students.

B. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department.

C. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.

D. The certificate template shall be as follows:

CERTIFICATE

Name of the college / institution _____

Name of the Department: _____

This is to certify that this Practical Record contains the bonafide record of the Practical work of Shri / Shrimati / Kumari _____ of B.A. _____ Semester _____ during the academic year _____. The candidate has satisfactorily completed the experiments prescribed by RashtrasantTukadojiMaharaj Nagpur University for the subject _____

Dated ___ / ___ / _____

Signature of the teacher who taught the examinee

1._____

2._____

Principal of the College

29. Repeal:- On issuance of this Direction the Direction No.12 of 2016shall stand repealed.

30. Saving :- Notwithstanding repeal of the Direction No 12 of 2016 and earlier Direction governing the annual pattern course of Bachelor of Arts, the students who had taken admission under the annual pattern course shall continue to be governed by the relevant Directions/Ordinance until they complete their course within the time permissible under the absorption scheme hereunder. On failure to complete the course within the permissible time and attempts such students, at their option, may be absorbed in the new course, under this Direction, as per the absorption scheme. Such student shall be eligible to get exemption in the equivalent subjects/papers which he/she has passed. The decision regarding equivalence of the subject shall be that of the Dean of the Faculty taken in consultation with the Chairman of the relevant Board of studies

19.8.2020

(Dr. Subhash R. Chaudhari)
Vice-Chancellor

Dated : 19 / 08 / 2020.

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY

"(Established by Government of Central Provinces Education Department by Notification No. 513 dated the 1st of August, 1923 & presently a State University governed by Maharashtra Public Universities Act, 2016 (Mah. Act no. VI of 2017.)"

DIRECTION NO. 17 OF 2018

Directions, Subject Scheme and Syllabus

For

Bachelor of Commerce (B.Com) Examinations

(Credit Based Semester Pattern)

FACULTY OF COMMERCE & MANAGEMENT

Bachelor of Commerce (B.Com) Examinations

2018-19 and Onwards

(Three Years Semester Pattern Under Graduate Course)

RASHTRASANT TUKDOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

Direction No. 17 of 2018

DIRECTION GOVERNING THE EXAMINATION LEADING TO THE DEGREE OF BACHELOR OF COMMERCE (CREDIT BASED SEMESTER PATTERN) UNDER FACULTY OF COMMERCE AND MANAGEMENT

(Issued by the Vice-Chancellor under section 12(8) of the Maharashtra Public Universities. Act, 2016)(Mah. Act No. VI of 2017)

WHEREAS, the Maharashtra Public Universities Act, 2016 (No. VI of 2017) (hereinafter Act) has come into force with effect from 1st March, 2017;

AND

WHERAS, the University Grants Commission, New Delhi vide letter no. D.O. No. F-2/2008/(XI Plan), Dated 31st January 2008 regarding new initiatives under the XI Plan-Academic reforms in the University has suggested for improving quality of higher education and to initiate the Academic reform at the earliest.

AND

WHEREAS, faculty of commerce and management in its meeting held 14.3.2016 has decided to update the existing syllabus for award of the degree of Bachelor of Commerce commensurate with the curricula existing in the various universities in India and with a view to include the latest trends in the commerce stream as well as to design it to suit to the needs of the industries and corporate houses,

AND

WHEREAS, University Grants Commission, New Delhi has prescribed the Model Curriculum for award of the Bachelor degree in the Faculty of commerce and directed to implement the same from the academic session 2016-2017

AND

WHEREAS, Chairman of all the Board of Studies in the Faculty of Commerce in their meeting held on 5.4.2016 prepared the Scheme of Credit Based Semester pattern for conduct of the B.Com. Examination,

AND

WHEREAS, Board of Studies viz. (1) Business Administration and Business Management, (2) Commerce, (3) Accounts and Statistics, (4) Business Economics and (5) Ad-hoc Board in Computer Application in its meetings held on 8.2.2016 respectively updated the existing Syllabi and recommended some modifications in the scheme of examination for graduate courses,

AND

WHEREAS, Coordinator of Task Force, Faculty of Commerce & Management has consented to the changes in the syllabus and the scheme of examination for the award of B.Com Degree,

AND

WHEREAS, the Vice-Chancellor, Nagpur University, Nagpur approved the recommendations so made by the Special Task Committee in the Faculty of Commerce duly concurred by the Coordinator, Faculty of Commerce as required under Section 38 (a) of the Act

AND

WHEREAS, As per the Advice of the Vice Chancellor, Coordinator, Faculty of Commerce & Management, Coordinator, Special Task Committee in the meeting held on 14.3.2016 constituted subcommittee for syllabus restructuring of B.Com with CBS pattern. The Sub-committee submitted the Draft Syllabus of B.Com with CBS pattern in meeting held on 5.4.2016

AND

WHEREAS, Direction No. 59 of 2016 entitled 'Examination leading to the Degree of Bachelor of Commerce (B.Com) (CREDIT BASED SEMESTER PATTERN) in the Faculty of Commerce & Management, was issued by the Vice-Chancellor;

AND

WHEREAS, in accordance with the provisions of the Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017) the Direction NO. 59 of 2016 stands expired;

AND

WHEREAS, the Joint Meeting of all the Chairman of Board of Studies under the Faculty of Commerce and Management and Dean, Faculty of Commerce and Management had approved the revised Syllabus and Scheme of Examination leading to the Degree of Bachelor of Commerce (Credit Based Semester Pattern) in its meeting held on 21st August 2018 and recommended the same for approval of the Hon'ble Vice-Chancellor;

AND

WHEREAS, the matter involved is required to be implemented urgently for the purpose of prescribing examinations leading to the degree of Bachelor of Commerce (B.Com) (CBS) in the Faculty of Commerce and Management;

AND

WHEREAS, the preparation of Ordinance to regulate the matter relating to the examinations leading to the degree of Bachelor of Commerce (B.Com) (CBS) is time consuming process;

Now, therefore, I, Dr. Siddharthvinayak P. Kane, Vice-Chancellor, Rastrasant Tukdoji Maharaj Nagpur University, Nagpur in exercise of the powers vested in me under Section 12(8) of the Maharashtra Public Universities Act, 2016 (VI of 2017) do hereby issue the following direction:-

- The Direction shall come into force with effect from the date of its issuance by the Vice-Chancellor. It shall also govern the students who were admitted to the B.Com.(C.B.S.) course in the academic sessions 2016-2017 and 2017-2018.

- The duration of the course shall be of **three** academic years consisting of the **six** semesters with university examination at the end of each semester namely

    - B.Com Semester I Examination
    - B. Com Semester II Examination
    - B. Com Semester III Examination
    - B.Com Semester IV Examination
    - B.Com Semester V Examination
    - B.Com Semester VI Examination

The examination shall be held at such places and on such dates which are notified by the University.

I. ELIGIBILITYTO THE COURSE

- The duration of B. Com. Course shall be of Three years consisting Semester-I &II in first year ,Semester-III &IV in second year and Semester-V &VI in third year

• Subject to compliance with the provisions of this direction and of other ordinances in force from time to time, an applicant for admission to this course shall have passed the XII Standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education, with English at Higher or Lower level and any Modern Indian Language at higher or lower level with any combination of optional subjects;

OR

• XII Standard Examination of Maharashtra State Board of Secondary and Higher Secondary Education in Vocational Stream with one language only; OR any other examination recognized as equivalent thereto; in such subjects and with such standards of attainments as may be prescribed Minimum Competition vocation course (MCVC).
•

OR

Any other Equivalent Examination of any State in (10+2) pattern with English & any combination of subjects

• The Examinations for Semesters I,II,III,IV , V and VI shall be held twice a year at Such places and on such dates as notified by the University.

• The fees for examination shall be as prescribed by the Rashtrasant Tukdoji Maharaj Nagpur University from time to time.

• Applicant for the examination pursuing the regular course of study leading to the Bachelor Degree in Commerce shall not be permitted to join any other course in this University or any other University simultaneously.

- **ATKT Rules** for Admission for the B.Com. Course -An unsuccessful examinee at the any semester examination shall be **ALLOWED TO KEEP TERM in accordance to the following table:**

Admission to Semester	**Candidate should have filled in the examination form of the R.T.M. Nagpur University**	**Candidate should have passed at least 50%of the passing heads of following examinations**
I Semester	As provided eligibility to the course, as above in the direction.	-
II Semester	Semester I	-
III Semester	-	Semester I and II taken together i.e. 6 heads clear
IV Semester	Semester III	-
V Semester	-	Semester I & II all heads clear& semester III & IV together i.e. 6 heads clear
VI Semester	Semester V	-

Note- The consideration of passing heads in respect of all the subjects, including languages, includes the University Theory Examination and Internal Assessment/Practical marks taken together for all subjects.

For providing teaching facility in the subjects of Elective Groups minimum requirement of students is 5.

II. CREDIT SYSTEM OF EVALUATION

- The B. COM. programme shall consist of **Thirty Six** Papers/Subjects in old terminology

With the issuance of this Direction, The Direction No 59 of 2016 shall stand repealed.

Sd/-

Nagpur: **(Dr. S.P. Kane)**

Dated : 18.9.2018 Vice-Chancellor

Subjects offered, contact hours, credits attached and allocation of marks shall be as follows:

APPENDIX-I

Scheme of teaching and examination under credit based semester system for B.Com Course.

Semester-I

Course Code	Subjects	Internal /University Exam.	Total Hours	Marks			Credits
				Semester EndExam.	Internal Assessment	Total Marks	
1T1	Financial Accounting-I	Uni.	60	80	20	100	4
1T2	Business Organization	Uni.	60	80	20	100	4
1T3	Company Law	Uni.	60	80	20	100	4
1T4	Business Economics-I	Uni.	60	80	20	100	4
1T5	Compulsory English	Uni.	60	80	20	100	4
1T6	Second Language 1T6.1- Supplementary English 1T6.2- Marathi 1T6.3- Hindi	Uni.	60	80	20	100	4.
Total			**360**	**480**	**120**	**600**	**24**

Note-.Second Language subject of B. Com. Semester ; I, II, III & IV shall be as follows:

A)The syllabus, question paper pattern and question paper of the following subjects :

1. Supplementary English, 2. Marathi, 3. Hindi will be as per the Commerce Language Board.

B) The syllabus , question paper pattern and question paper of the following subjects :

Sanskrit, Urdu, Gujarathi, Telgu, Bengali, Persian, Arebic Pali &Prakrit, Latin will be as per the Boards of the faculty of Arts for B.A. Semester- I, II, III & IV respectively.

Vocational Courses :Semester -I

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Mark		
1T7	Entrepreneurship Development	60	80	20	-	40	100	4
1T8	1T8.1- Computer Application-II **or** 1T8.2- Principles and Practice of Insurance-II **or** 1T8.3- Advertising, Sales Promotion & Sales Management-II	60	80	20	-	40	100	4

Semester-II

Course Code	Subjects	Internal /University Exam.	Total Hours	Marks			Credits
				Semester EndExam.	Internal Assessment	Total Marks	
2T1	Statistics and Business Mathematics	Uni.	60	80	20	100	4
2T2	Business Management	Uni.	60	80	20	100	4
2T3	Secretarial Practice	Uni.	60	80	20	100	4
2T4	Business Economics-II	Uni.	60	80	20	100	4
2T5	Compulsory English	Uni.	60	80	20	100	4
2T6	Second Language 2T6.1- Supplementary English 2T6.2- Marathi 2T6.3-	Uni.	60	80	20	100	4.
Total			**360**	**480**	**120**	**600**	**24**

Note-.Second Language subject of B. Com. Semester ; I, II, III & IV shall be as follows:

A)The syllabus, question paper pattern and question paper of the following subjects :

1. Supplementary English, 2. Marathi, 3. Hindi will be as per the Commerce Language Board.

B) The syllabus , question paper pattern and question paper of the following subjects :

Sanskrit, Urdu, Gujarathi, Telgu, Bengali, Persian, Arebic Pali &Prakrit, Latin will be as per the Boards of the faculty of Arts for B.A. Semester- I, II, III & IV respectively.

Vocational Courses : Semester -II

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks (TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Marks		
2T7	Entrepreneurship Development	60	80	20	-	40	100	4
2T8	2T8.1- Computer Application-II **or** 2T8.2- Principles and Practice of Insurance-II **or** 2T8.3- Advertising, Sales Promotion & Sales Management-II	60	80	20	-	40	100	4

Semester-III

Course Code	Subjects	Internal /University Exam.	Total Hours	Marks			Credits
				Semester End Exam.	Internal Assessment	Total Marks	
3T1	Financial Accounting -II	Uni.	60	80	20	100	4
3T2	Business Communication & Management	Uni.	60	80	20	100	4
3T3	Business Law	Uni.	60	80	20	100	4
3T4	Monetary Economics –I	Uni.	60	80	20	100	4
3T5	Compulsory English	Uni.	60	80	20	100	4
3T6	Second Language 3T6.1- Supplementary English 3T6.2- Marathi 3T6.3- Hindi	Uni.	60	80	20	100	4.
Total			**360**	**480**	**120**	**600**	**24**

Note-Second Language subject of B. Com. Semester ; I, II, III & IV shall be as follows:

A)The syllabus, question paper pattern and question paper of the following subjects :

1. Supplementary English, 2. Marathi, 3. Hindi will be as per the Commerce Language Board.

B) The syllabus , question paper pattern and question paper of the following subjects :

Sanskrit, Urdu, Gujarathi, Telgu, Bengali, Persian, ArebicPali&Prakrit, Latin will be as per the Boards of the faculty of Arts for B.A. Semester- I, II, III & IV respectively.

Vocational Courses :Semester-III

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks (TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Marks		
3T7	Entrepreneurship Development	60	80	20	-	40	100	4
3T8	3T8.1- Computer Application-II **or** 3T8.2- Principles and Practice of Insurance-II **or** 3T8.3- Advertising, Sales Promotion & Sales Management-II	60	80	20	-	40	100	4

Semester-IV

Course Code	Subjects	Internal /University Exam.	Total Hours	sMarks			Credits
				Semester End Exam.	Internal Assessment	Total Marks	
4T1	Financial Accounting -III	Uni.	60	80	20	100	4
4T2	Skill Development	Uni.	60	80	20	100	4
4T3	Income Tax	Uni.	60	80	20	100	4
4T4	Monetary Economics-II	Uni.	60	80	20	100	4
4T5	Compulsory English	Uni.	60	80	20	100	4
4T6	Second Language 4T6.1- Supplementary English 4T6.2- Marathi 4T6.3- Hindi	Uni.	60	80	20	100	4.
Total			**360**	**480**	**120**	**600**	**24**

Note-1.For rest of Indian Languages the code is as per syllabus of B.A. Semester –I

2. Second Language subject of B. Com. Semester ; I, II, III & IV shall be as follows:

A)The syllabus, question paper pattern and question paper of the following subjects :

1. Supplementary English, 2. Marathi, 3. Hindi will be as per the Commerce Language Board.

B) The syllabus , question paper pattern and question paper of the following subjects :

Sanskrit, Urdu, Guajarati, Telgu, Bengali, Persian, Arabic Pali &Prakrit, Latin will be as per the Boards of the faculty of Arts for B.A. Semester- I, II, III & IV respectively.

Vocational Courses :Semester-IV

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks (TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Marks		
4T7	Entrepreneurship Development-IV	60	80	20	-	40	100	4
4T8	4T8.1- Computer Application-IV **or** 4T8.2- Principles and Practice of Insurance-IV **Or** 4T8.3- Advertising, Sales Promotion and Sales Management-IV	60	80	20	-	40	100	4

Semester-V

Course Code	Subjects	Internal /Uni. Examination	Total Hours	Marks			Credits
				Semester End Exam.	Internal Assessment	Total Marks	
5T1	**Core Group** 1. Financial Accounting- IV	Uni.	60	80	20	100	4
5T2	2.Cost Accounting	Uni.	60	80	20	100	4
5T3	3. Indian Economy- I	Uni.	60	80	20	100	4
5T4	**Elective Group –I (Any One)** 5T4.1 Marketing Management **OR** 5T4.2 Computerized Accounting	Uni.	60	80	20	100	4
5T5	**Elective Group- II (Any Two)** 5T5.1 Business Finance -I **OR** 5T5.2 Auditing **OR** 5T5.3 Management Process	Uni. Uni.	60 60	80 80	20 20	100 100	4 4
Total			**360**	**480**	**120**	**600**	**24**

Vocational Courses :Semester-V

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks (TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Marks		
5T7	Entrepreneurship Development-V	60	80	20	-	40	100	4
5T8	5T8.1 Computer Application-V **Or** 5T8.2 Principles and Practice of Insurance-V **Or** 5T8.3 Advertising, Sales Promotion and Sales Management-V	60	80	20	-	40	100	4

Semester-VI

Course Code	Subjects	University Examination	Total Internal /Hours	Marks			Credits
				Semester End Exam.	Internal Assessment	Total Marks	
	Core Group						
6T1	1. Financial Accounting -V	Uni.	60	80	20	100	4
6T2	2.Management Accounting	Uni.	60	80	20	100	4
6T3	3.Indian Economy - II	Uni.	60	80	20	100	4
6T4	**Elective Group-II (Any One)** 6T4.1 Human Resource Management **OR** 6T4.2- Indirect Tax	Uni.	60	80	20	100	4
6T5	**Elective Group-II (Any Two)** 6T5.1 Business Finance - II **OR** 6T5.2 Industrial Law **OR** 6T5.3 Advanced Statistics	Uni. Uni.	60 60	80 80	20 20	100 100	4 4
Total			**360**	**480**	**120**	**600**	**24**

Vocational Courses :Semester-VI

Course Code	Subjects	Total Hours	Examination Scheme				Total Marks (TH. + PR + IM)	Credits
			Theory (Uni)	Internal (College)	Practical (Uni)			
			Max Marks Theory Paper (TH)	Max Marks (IM)	Max Marks Practical (PR)	Min Passing Marks		
6T7	Entrepreneurship Development-VI	60	80	20	-	40	100	4
6T8	6T8.1 Computer Application-VI **Or** 6T8.2 Principles and Practice of Insurance-VI **Or** 6T8.3 Advertising, Sales Promotion and Sales Management-VI	60	80	20	-	40	100	4

III Choice of Vocational Courses :

Apart from doing General B.Com, students can opt for vocational courses in B. Com as under :

- ***Vocational subjects:*** The various vocational courses (mainly sponsored by UGC) which can be chosen by the students are given below. As per the UGC letter no. F.9-3/95 (Desk-VE) dated 23.12.1999 a course for **Entrepreneurial Development is compulsory** for students opting for vocational subjects. Thus with every vocational subject there will be one paper of Entrepreneurship Development.

Group –I - Computer Applications
I. Entrepreneurship Development- Paper-I
II. Computer Applications
(2 papers in each year i.e. 6 papers in 3 years)

Group –II - Principles and Practice of Insurance
I. Entrepreneurship Development- Paper-I
II. Principles and Practice of Insurance
(2 papers in each year i.e. 6 papers in 3 years)

Group –III - Advertising, Sales Promotion And Sales Management
I. Entrepreneurship Development- Paper-I
II. Advertising, Sales Promotion And Sales Management
(2 papers in each year i.e. 6 papers in 3 years)

NOTE :
Students opting for UGC Vocational subject (any one group of the two mentioned above) may select the same in lieu of following mentioned subjects in the respective Semester.

B.Com. Semester-I :
a. Second Language subject i.e. Hindi, Marathi, Supp. English, etc.
b. Company Law

B.Com. Semester-II :
a. Second Language subject i.e. Hindi, Marathi, Supp. English, etc.
b. Secretarial Practice

B.Com. Semester-III :
a. Second Language subject i.e. Hindi, Marathi, Supp. English, etc.
b. Business Communication and Management

B.Com. Semester-IV :
a. Second Language subject i.e. Hindi, Marathi, Supp. English, etc.
b. Skill Development

B.Com. Semester-V :
a. Core Group-I
b. Elective Group-I

B.Com. Semester-VI :
a. Core Group-II
b. Elective Group-II

Summary of the Total Marks and Credits

Sr. No.		Instruction Hours	Total Marks) Semester End Exam.	Credits
1	Semester–I	360	600	24
2	Semester–II	360	600	24
3	Semester–III	360	600	24
4	Semester–IV	360	600	24
5	Semester–V	360	600	24
6	Semester–VI	360	600	24
Total		2160	3600	144

- The Semester End written examination of all subjects shall be conducted by the University.

B.COM. Examination Semester–I

Subject	Examination Scheme	Maximum Marks	Minimum Passing Marks (Combined)
1. Financial Accounting – I	*University Theory Examination*	80	40
	Internal Assessment	20	
	Total	100	
2. Business Organization	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
3. Company Law	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
4.Business Economics-I	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
5. Compulsory English	University Theory Examination	80	
	Internal Assessment	20	

	Total	100	40
6. Second Language	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
Total		**600**	**240**

B.COM. Examination Semester–II

Subject	Examination Scheme	Maximum Marks	Minimum PassingMarks (Combined)
1. Statistics &.Business mathematics	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
2. Business Organization	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
3. Company Law	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
4. Business Economics-II	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
5. Compulsory English	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
6. Second Language	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
Total		**600**	**240**

B.COM. Examination Semester–III

Subject	Examination Scheme	Maximum Marks	Minimum Passing Marks (Combined)
1. Financial Accounting –II	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
2. Business Communication and Management	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
3. Business Law	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
4.Monetary Economics-I	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
5. Compulsory English	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
6.Second Language	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
Total		**600**	**240**

B.COM. Examination Semester–IV

Subject	Examination Scheme	Maximum Marks	Minimum Passing Marks (Combined)
1. Financial Accounting – III	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
2. Skill Development	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
3. Income Tax	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
4.Monetary Economics-II	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
5. Compulsory English	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
6.Second Language	University Theory Examination	80	
	Internal Assessment	20	
	Total	100	40
Total		**600**	**240**

B.COM. Examination Semester–V

Subject	Examination Scheme	Maximum Marks	Minimum PassingMarks (Combined)
Group **1.** Financial Accounting-IV	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
2.Cost Accounting	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
3. Indian Economy- I	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
4. Elective Group-I (Any One) Marketing Management **OR** Computerized Accounting.	University Theory Examination	**80**	40
	Internal Assessment	20	
	Total	100	
5. Elective Group- II(Any Two) Business Finance -I **OR** Auditing **OR** Management Process	University Theory Examination	**80** **80**	40 40
	Internal Assessment	20 20	
	Total	100 100	
Total		**600**	**240**

B.COM. Examination Semester–VI

Subject	Examination Scheme	Maximum Marks	Minimum PassingMarks (Combined)
Group 1.Financial Accounting -V	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
2.Management Accounting	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
3. Indian Economy II	University Theory Examination	80	40
	Internal Assessment	20	
	Total	100	
4. Elective Group-I (Any One) Human Resource Management **OR** Indirect Tax	University Theory Examination	**80**	40
	Internal Assessment	20	
	Total	100	
5. Elective Group- II Business Finance –II **OR** Industrial Law **OR** Advanced Statistics	University Theory Examination	**80** **80**	40 40
	Internal Assessment	20 20	
	Total	100 100	
Total		**600**	**240**

APPENDIX-II

I. GENERAL RULES AND REGULATIONS

The scope of the subject, percentage of passing in theory will be governed as per following rules:

- In order to pass at the Semester I, II, III, IV, V and VI examinations an examinee shall obtain not less than 40% marks in each paper. This is to say that out of total 100 marks student should score 40 marks jointly in university examination (80 Marks) and internal examination (20 marks).
- The results of successful candidates at the end of semester-VI shall be classified on the basis of aggregate marks obtained in all the six semesters.
- The candidates who pass all the semester examinations in the first attempt are eligible for ranks.
- The results of the candidates who have passed the Semester-VI examination but not passed the lower semester examinations shall be declared as NCL (not completed lower semester examinations). Such candidates shall be eligible for the Degree only after successful completion of all the lower semester examinations.
- Percentage of marks for declaring class:
  Distinction- 75% and above (First Class With Distinction).
  First Class- 60% and above
  Second Class 45% and above but less than 60%.
  Third Class 40% but not less than 45%
- An unsuccessful examinee at the any semester wise end examination shall be eligible for re-examination on payment of a fresh Examination fee prescribed by the University.

II.TEACHING NORMS FOR THEORY PAPERS

- For all Theory Papers there shall be **FIVE Periods Per week per Subject of 48 Minutes duration** each. Each Theory Paper must cover minimum 60 Clock Hours of Teaching and 360Clock Hours for semester I, II, III IV, V & VI form awl the 6 papers and One Credit, subject of Theory will be of 1 Clock Hour
- No person shall be admitted to this Programme, if he has already passed the same Programme or a Programme of any other statutory University (which has been recognized as equivalent to this programme.)
- A candidate who fails in any of the semester examinations may be permitted to take the examinations again at a subsequent appearance as per the syllabus and scheme of

examination in vogue at the time the candidate took the examination for the first time. This facility shall be limited to the following two years i.e. 4 more attempts.

- Examinee successful at the Semester I, II, III, IV, V and VI examinations shall, on payment of the prescribed fee, receive a Degree in the prescribed form signed by the Vice-Chancellor.

- Qualification of Teacher shall be as per U.G.C. and State Government norms.

APPENDIX- III

Rashtrasant Tukdoji Maharaj Nagpur University

I. SUBJECTS FOR B.Com. EXAMINATION

Semester–I

1. 1T1-Financial Accounting-I
2. 1T2- Business Organization
3.1T3 Company Law
4. 1T4 Business Economics –I
5.1T5 Compulsory English
6.1T6 Second Language

Semester–II

1. 2T1 Statistics and Business Mathematics
2. 2T2 Business Management
3. 2T3 Secretarial Practice
4. 2T4 Business Economics –II
5.2T5 Compulsory English
6.2T6 Second Language

Semester–III

1. 3T1 Financial Accounting-II
2. 3T2 Business Communication and Management
3. 3T3 Business Law
4. 3T4 Monetary Economics –I
5.3T5. Compulsory English
6. 3T6 Second Language

Semester–IV

1. 4T1 Financial Accounting-III
2. 4T2 Skill Development.
3. 4T3 Income Tax
4. 4T4 Monetary Economics –II
5. 4T5 Compulsory English
6.4T6 Second Language

Semester–V

Core Group	1. 5T1 Financial Accounting IV
	2.5T2 Management Accounting
	3. 5T3 Indian Economy-I
Elective Group-I (Any One)	4. 5T4 .1 - Marketing Management **OR** 5T4.2 - Computerizes Accounting
Elective Group – II **(Any Two)**	5. 5T5.1- Business Finance 1 **OR** 5T5.2 - Auditing **OR** 5T5.3 – Management Process

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Semester–VI

Core Group	1.6T1 Financial Accounting -V
	2. 6T2 Cost Accounting
	4. 6T3 Indian Economy – I
Elective Group-II (Any One)	4. 6T4.1- Human Resource Management **OR** 6T5.2 - Indirect Tax
Foundation Group II **(Any Two)**	5. 6T5.1 - Business Finance-II **OR** 6T5.2 - Industrial Law **OR** 6T5.3 – Advanced Statistics

Workload

Workload Chart (70 periods per week)(Odd Semesters)(July to November)

B. Com. Semester - I			B. Com. Semester – III			B. Com. Semester – V		
S. No.	**Subjects**	**N/o. of Periods**	**S. No.**	**Subjects**	**No. of Periods**	**S. No.**	**Subjects**	**No. of Periods**
1.	Financial Accounting-I	**5**	**1.**	Financial Accounting-II	**5**	**1.**	**Core Group** 1. Financial Accounting IV	**5**
2.	Business Organization	**5**	**2.**	Business Communication and Management	**5**	**2**	Cost Accounting	**5**
						3	Indian Economy -I	**5**
3	Company Law	**5**	**3.**	Business Law	**5**	**4.**	**Elective Group** - I Marketing Management **OR** Computerized Accounting	**5**
4.	Business Economics –I	**5**	**4.**	Monetary Economics -I	**5**	**5.**	**Elective Group** - I I Business Finance -I **OR** Auditing **OR** Management Process	**5** **5**
Total Periods		**20**	**Total Periods**		**20**	**Total Periods**		**30**

Workload Chart (70 periods per week)(Even Semesters)

(December to April)

B. Com. Semester - II			B. Com. Semester – IV			B. Com. Semester – VI		
S. No.	**Subjects**	**No. of Periods**	**S. No.**	**Subjects**	**No. of Periods**	**S. No.**	**Subjects**	**No. of Periods**
1.	Statistics and Business Mathematics	**5**	**1.**	Financial Accounting-III	**5**		**Core Group**	
						1.	Financial Accounting-V	**5**
						2.	Cost Accounting	**5**
2.	Business Management	**5**	**2.**	Skill Development.	**5**	**3.**	Indian Economy-II	**5**
3.	Secretarial Practice	**5**	**3.**	Income Tax	**5**	**4.**	**Elective Group**-I Human Resource Management **OR** Indirect Tax	**5**
4.	Business Economics – II	**5**	**4.**	Monetary Economics –II	**5**	**5.**	**Elective Group**- II Business Finance-II	**5**
							OR Industrial Law	**5**
							OR Advanced Statistics	
Total Periods		**20**			**20**			**30**

WEEKLY Workload Chart (LANGUAGES) (For Semesters I, II, III & IV)

	SUBJECT(S)	PERIODS
1.	**Compulsory English**	**5 PERIODS OF THEORY** **+** **1 PERIOD OF TUTORIAL FOR A BATCH OF 20 STUDENTS**
2.	**Second Language - Supplementary English/ Hindi/Marathi/Sanskrit etc.**	**5 PERIODS OF THEORY**

II. CONVERSION OF MARKS TO GRADES AND CALCULATIONS OF GPA (GRADE POINT AVERAGE) AND CGPA (CUMULATIVE GRADE POINT AVERAGE) :

In the Credit and Grade Point System, the assessment of individual Subjects in the concerned examinations will be on the basis of marks only, but the marks shall later be converted into Grades by some mechanism wherein the overall performance of the Learners can be reflected after considering the Credit Points for any given course. However, the overall evaluation shall be designated in terms of Grade. There are some abbreviations used here that need understanding of each and every parameter involved in grade computation and the evaluation mechanism. The abbreviations and formulae used are as follows:-

Abbreviations and Formulae Used

G : Grade

GP : Grade Points

C : Credits

CP : Credit Points

CG : Credits X Grades (Product of credits & Grades)

SGPA = ΣCG: Sum of Product of Credits & Grades points / ΣC: Sum of Credits points

SGPA : Semester Grade Point Average shall be calculated for individual semesters. (It is also designated as GPA)

CGPA : Cumulative Grade Point Average shall be calculated for the entire Programme by considering all the semesters taken together.

While calculating the CG the value of Grade Point 1 shall be consider Zero (0) in case of learners who failed in the concerned course/s i.e. obtained the marks below 40. After calculating the SGPA for an individual semester and the CGPA for entire programme, the

value can be matched with the grade in the Grade Point table as per the Five (05) Points Grading System and expressed as a single designated GRADE such as O,A,B,C, F. (Fail).

Marks	Grade	Grade Points
75& above	O (Outstanding)	10
60-74	A (Very Good)	09
45-59	B (Good)	08
40-44	C (Average)	07
39& Below	F (Fail)	00

CGPA	**Grade**	**Division**
10	O (Outstanding)	**Distinction**
9-10	A(Very Good)	**First**
8-9	B (Good)	**Second**
7-8	C (Average)	**Third**

Note: -

- Consider Grade Points equal to Zero for (C x G) calculations of failed Learner/s in the concerned course/s.

The illustration for the conversion of marks into grades in a course and semester Illustrations of Calculation:- Pass

Subjects	TotalMaximumMarks	Total Minimum Marks	TotalMarks Obtained	Grade(G)	Gradepoints(GP)	Credit oftheCourse(C)	(Credit) X (Grade points)(CX GP)	SGPA=Σ CG/Σ C
C-11	100	40	60	A	9	4	36	**SGPA** =208/24 =8.67 **Grade B RESULT =PASS**
C-12	100	40	50	B	8	4	32	
C-13	100	40	75	O	10	4	40	
C-14	100	40	70	A	9	4	36	
C-15	100	40	48	B	8	4	32	
C-16	**100**	**40**	**52**	**B**	**8**	**4**	**32**	
Total	**600**	240	**355**	**--**	**48**	**24**	**208**	

Illustrations of Calculation:- Fail

Subjects	TotalMaximumMarks	TotalMarks Obtained	Grade(G)	Gradepoints(GP)	Credit oftheCourse(C)	(Credit) X (Grade points)(CX GP)	SGPA=Σ CG/Σ C
C-31	100	32	F	0	4	00	**SGPA** =102/24 =4**.24** **GradeF** **RESULT =FAIL**
C-32	100	34	F	0	4	00	
C-33	100	60	B	8	4	32	
C-34	100	75	O	10	4	40	
C-35	100	33	F	0	4	00	
C-36	**100**	**55**	**B**	**8**	**4**	**32**	
Total	**600**	**304**	**--**	**26**	**24**	**102**	

Provision of Direction No.44 of 2001 governing the award of grace marks for passing an examination, securing higher Grades shall apply to the examination

III. GUIDELINES FOR SETTING QUESTION PAPERS:

- .The question paper should be set in such a manner so as to cover the complete syllabus as prescribed by the University.

- .The numerical questions in any of the subjects shall be set in ENGLISH only and the candidate shall have to answer such questions in ENGLISH only. The candidate may answer non-numerical questions in ENGLISH, MARATHI or HINDI.

- The duration of the Semester wise End Examination shall be **3.00** Hours per course.

Revised Absorption Scheme B. Com.(old course Annual Pattern) 2014-2015 to CBS New Course introduced in 2016-2017, issued under Direction No. 59 of 2016

1. It is notified for general information of all concerned that the failure students of **B.Com. old course Annual Pattern introduced in 2014 shall be absorbed in the new course CBS Pattern introduced from the session 2016-2017 examination with the following scheme.**

2. The University shall conduct the examination of old course for three more consecutive examinations after the new scheme of examination is introduced as per following table:

B.Com. Examination	Attempt 1	Attempt 2	Attempt 3
B.Com. Part I	Winter 2016	Summer 2017	Winter 2017
B.Com. Part II	Winter 2017	Summer 2018	Winter 2018
B.Com. Part III	Winter 2018	Summer 2019	Winter 2019

.

3.Those who have completed & passed **B.Com. Part-I as per Old course (Annual pattern)** are eligible for admission in the **B.Com. II, SEM - III New Course**

4. **The failure students of B.Com. I and B.Com. II of old course (Annual Pattern - Introduced in 2014) can be admitted to the 3rd and 5th semester of B.Com Course Semester Pattern respectively under this direction under the ATKT rules prevailing in Old Course (Introduced in 2014). However, they will be required to clear papers of annual pattern course in which they failed in 3 attempts as mentioned in above table.**

5. The students are required to clear all their papers within the stipulated time. The students who failed to clear their course in three consecutive attempts as per this clause, will be required to appear in equivalent papers of new CBS semester pattern indicated in **Appendix.I, II & III**

Note:

The students who will appear in equivalent papers of **new course CBS scheme** paper with maximum theory marks 80, will get proportional marks out of 100, updated in **old course mark sheet** of **B.Com. I**

6. Those who have completed & passed **B.Com. Part - I & B.Com. Part - II as per Old course** are eligible for admission in the **B.Com. Part – III, Sem - V (New course).**

7. Failure students of **B.Com. Part - II old course** and having ATKT as per rules are eligible to take admission in **B.Com. Part-III , Semester V New Course.** They should clear their **B.Com. Part - II old course backlog** papers in next **three attempts (Last Chance Winter 2018).** If they fail to pass in **Winter-2018** attempt they will have to appear in equivalent papers of **new course CBS scheme** as per absorption scheme indicated in **Appendix- II**.

Note:

The students who will appear in parallel papers of **new course CBS scheme** paper with maximum theory marks 80, will get proportional marks out of 100, updated in **old course mark sheet** of **B.Com. Part–II.**

8. Failure students of **B.Com. Part-III old course** are having chances upto **winter 2019** examination **(Last Chance)**. So they should appear **B.Com. Part-III old course examination & is required to clear their backlog**. After that those who will have backlog in the **B.Com. Part-III old course** will have to appear in equivalent papers of **new course CBS scheme** as per the absorption scheme indicated in **Appendix- III**.

Note:

The students who will appear in parallel papers of **new course CBS scheme** paper with maximum theory marks 80, will get proportional marks out of 100, updated in **old course** mark sheet of **B.Com. Part-III**.

The equivalence & exemption of subjects for the students absorbed in the new course shall be as Below

Appendix- I B.Com Part- I

Sr. No.	Old Course 2014-2015	Max. Marks	Sr. No.	New Course 2016-2017	Max. Marks.
	Theory			Theory	
1	Compulsory English	100	1	Compulsory English -Sem I	80
2	IInd Language (Other Indian language as per syllabus) (Hindi, Marathi,etc.)	100	2	IInd Language (Other Indian language as per syllabus) (Hindi, Marathi,etc.)-Sem-I	80
3	Financial Accounting-I	100	3	Financial Accounting-I Sem- I	80
4	Fundamentals of Statistics& Computer	100	4	Statistics & Business Mathematics-Sem-II	80
5.	Principles of Business Management	100	5.	Business Management-Sem-II	80
6	Business Economics	100	6	Business Economics-II Sem-II	80
7.	Company Law & Secretarial Practice(CLSP)	100	7	Company Law- Sem-I	80

Appendix- II B.Com Part- II

Sr. No.	Old Course 2014-2015	Max. Marks	Sr. No.	New Course 2016-2017	Max. Marks.
	Theory			Theory	
1	Compulsory English	100	1	Compulsory English -Sem III	80
2	IInd Language (Other Indian language as per syllabus) (Hindi, Marathi,etc.)	100	2	IInd Language (Other Indian language as per syllabus) (Hindi, Marathi,etc.)-Sem-III	80
3	Financial Accounting-II	100	3	Financial Accounting-II Sem- III	80
4	Cost & Management Accounting	100	4	Cost Accounting- Sem- V	80
5.	Business Communication	100	5.	Business Communication & Management-Sem-III	80
6	Monetary Economics	100	6	Monetary Economics-I I Sem-IV	80
7.	Business & Industrial Law	100	7	Business Law- Sem-III	80

Appendix- III B.Com Part- III

Sr. No.	Old Course 2014-2015	Max. Marks	Sr. No.	New Course 2016-2017	Max. Marks.
	Theory			Theory	
1	Financial Accounting –III	100	1.	Financial Accounting –III Sem- V	80
2	Income Tax & Auditing	100	2.	Auditing Sem- V	80
3	Functional Management	100	3	Management Process- SemV	80
4	Indian Economy	100	4	Indian Economy-II Sem-VI	80
5.	Business Finance	100		Business Finance- II Sem-VI	80
6	Computerized Accounting	80		Computerized Accounting- Sem-V	80

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FACULTY OF SCIENCE

DIRECTION NO. 9 OF 2016

DIRECTION GOVERNING THE EXAMINATION LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

(THREE YEARS DEGREE COURSE – SEMESTER PATTERN)

(Issued under Section 14(8) of the Maharashtra Universities Act, 1994)

Whereas, Maharashtra Universities Act No. XXXV has come into force with effect from 22nd July, 1994 and further amended by Maharashtra Universities (Amendment and Continuance)Act, 2003, hereinafter referred as 'Act' has come into force from 8th August 2003.

AND

Whereas, the University Grants Commission, New Delhi vide letter No.D.O.No.F 1-2/2008/(XI Plan), dated.31 Jan.2008 regarding new initiatives under the XIth Plan – Academic Reforms in the University has suggested for improving quality of higher education and to initiate the Academic Reforms at the earliest.

AND

Whereas, the Board of Studies in all the Science subjects in their meeting held during 21/04/2012 prepared the syllabi and scheme of examination for the B. Sc. degree course and recommended for starting of the semester pattern in Faculty of Science from the academic session 2013-14,

AND

Whereas, the recommendations of various Board of Studies in the faculty of Science regarding Upgradation and Revision of various syllabi and introduction and implementation of Semester Pattern Examination System at under graduate level was considered by the faculty of Science in its meeting held on 19/09/2012 and constituted a Committee to decide the policy decision regarding semester pattern examination system.

AND

Whereas, the Dean, Faculty of Science has consented to the syllabi and the scheme of examination for the award of B.Sc. degree in Faculty of Science,

AND

Whereas, the faculty of Science in its meeting held on 19/09/2012 vide item No. 35, has considered, accepted and recommended to Academic Council, the policy decision regarding introduction of Semester pattern and the draft syllabi of B.Sc. Semester-I & VI along with draft direction and other details.

AND

Whereas, the Emergent Faculty of Science in its meeting held on 27.1.2015, has considered, accepted and recommended to Academic Council, for B.Sc. Semester-I to VI along with draft direction and other details.

AND

Whereas, the Vice Chancellor of Rashtrasant Tukadoji Maharaj Nagpur University, in exercise of powers conferred upon me under sub-section (7) of section 14 of the Maharashtra Universities Act., 1994, on behalf of the Academic Council & Management Council for B.Sc. along with draft direction and other details.

AND

Whereas, the new scheme of examination as per semester pattern is to be implemented from the Academic Session 2013-14 for B. Sc. First Year & onwards which is to be regulated by this direction and as such there is no direction issued and in existence and framing of an Ordinance for the above examination is a time consuming process.

AND

Whereas, the admission of students in the semester pattern at B.Sc. First Year are to be made in the Academic Session 2013-14.

Now, therefore, I, Dr. V.S. Deshpande, Vice Chancellor of Rashtrasant Tukadoji Maharaj Nagpur University, in exercise of powers conferred upon me under sub-section (8) of section 14 of the Maharashtra Universities Act., 1994, do hereby direct as under:

1. This Direction may be called, **"Examination leading to the Degree of Bachelor of Science (Three Year Degree Course-Semester Pattern).**

2. This direction shall come into force with effect from the date of its issuance.

3. (i) The following shall be the examination leading to the Degree of Bachelor of Science in the faculty of Science namely:

a. The B.Sc. Semester-I Examination;

b. The B.Sc. Semester-II Examination;

c. The B.Sc. Semester-III Examination;

d. The B.Sc. Semester-IV Examination;

e. The B.Sc. Semester-V Examination; and

f. The B.Sc. Semester-VI Examination.

(ii) The period of Academic Session shall be such, as may be notified by the University.

4. The theory examination of Semester-I, II, III, IV, V and VI shall be conducted by the University and shall be held separately at the end of each semester at such places and dates as may be decided by the University and shall be held as per the schedule given in Table 1.

Table 1

Sr. No	Name of the Examination	Main Examination	Supplementary Examination
1	Semester I, III and V	Winter	Summer
2	Semester II, IV, and VI	Summer	Winter

5. Subject to compliance with the provisions of this Direction and of other Ordinances in-force from time to time, the following persons shall be eligible for admission to the examinations:-

(a) A student who has prosecuted a regular course of study for not less than one academic year prior to that examination;

(b) A teacher in an Educational Institution eligible under the provisions of Ordinance No. 18, and

(c) A women candidate who has not pursued a regular course of study.

Provided that in the case of the persons eligible under clauses (b) and (c), an applicant to the examination shall have attended a full course of laboratory instructions in a College in the subject in which laboratory work is prescribed. The candidate shall submit a Certificate to that effect signed by the Principal of the college.

6. Eligibility of every applicant for admission to B. Sc. Semester course shall:-

A) In case of the B. Sc. Semester I examination:-

The candidate should have passed the 12th Standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education with English and other Modern Indian Languages together with any three Science subjects comprised in the faculty of Science or an examination recognized as equivalent thereto in such subjects and with such standards of attainments as may be prescribed.

Provided that students passing the 12th Standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education and offering Vocational Stream with one Language only and with any one of the following groups of subjects shall be eligible for admission to the B. Sc. Semester I course and in onward semesters with the corresponding group of subjects as shown in Table 2:-

Table 2

S. No.	Groups of subjects of 12th Standard students	Corresponding Next Higher Examination groups of Science subjects at B. Sc. Semester I (Along with Compulsory English and any one of the languages from Marathi, Hindi, Urdu, Gujarati, Telugu, Bengali, Sanskrit, Supplementary English, French, German, Russian, Persian, Arabic, Pali and Prakrit or Latin in B. Sc. Semester I & II only).
1	1. English or Any Modern Language 2. Physics, Chemistry, Mathematics, Biology	Combination of any 3 science subjects as shown in table 4 from among Physics, Chemistry, Mathematics, Statistics, Geology, Electronics, Industrial Chemistry, Computer Science, Information Technology, Botany, Zoology, Biochemistry, Microbiology, Biotechnology, Environmental Science, Sericulture, Geo-exploration and Drilling Technology, Computer Maintenance, Electronic Equipment Maintenance, Industrial Fish & Fisheries
2	1. English or Any Modern Language 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Mathematics	Combination of any 3 science subjects as shown in table 4 from among Physics, Chemistry, Mathematics, Statistics, Computer Science, Information Technology, Geology, Electronics, Industrial Chemistry, Geo-exploration and Drilling Technology, Computer Maintenance, Electronic Equipment Maintenance.
3	1. English or Any Modern Language 2. Vocational Course of 200 Marks 3. Physics, Chemistry, Biology	Combination of any 3 science subjects as shown in table 4 from among Chemistry, Botany, Zoology, Biochemistry, Microbiology, Biotechnology, Geology, Computer Science, Information Technology, Industrial Chemistry, Environmental Science, Sericulture, Geo-exploration and Drilling Technology, Computer Maintenance, Electronic Equipment Maintenance, Industrial Fish & Fisheries
4	MCVC Group	

	a) Agriculture Group Or Fisheries Group	Combination of any 3 science subjects as shown in table 4 from among Botany, Zoology, Microbiology, Bio-Technology, Bio-Chemistry, Geology, Chemistry, Environmental Science, Sericulture, Industrial Fish & Fisheries
	b) Para-medical group	Combination of any 3 science subjects as shown in table 4 from among Botany, Zoology, Micro-biology, Biochemistry, Bio-Technology, Chemistry, Environmental Science, Sericulture, Industrial Fish & Fisheries.
	c) Engineering and Technology or Engineering & Technology repairs & maintenance group at M.C.V.C.	Combination of any 3 science subjects as shown in table 4 from among Physics, Chemistry, Electronics, Computer Science, Information Technology, Mathematics, Statistics, Industrial Chemistry, Computer Maintenance, Electronics Equipment Maintenance
	d) Engineering and Technology Group Electronics Technology Trade	Combination of any 3 science subjects as shown in table 4 from among Physics, Computer Science, Information Technology, Statistics, Chemistry, Mathematics, Industrial Chemistry, Electronics, Information Technology, Computer Maintenance, Electronic Equipment Maintenance.
NOTE: For finalization of admission under Sr. No. 4 a) and b), Chemistry at Standard XII level will be compulsory AND For admission under Sr. No. 4 c) and d), Mathematics at Standard XII level will be compulsory.		

B) In case of the B. Sc. Semester II, III, IV, V and VI Examinations:- The student should have attended a minimum of 90 days in the respective semester and passed the previous semester examination as per the rules of ATKT as mentioned in Para 7 of this direction.

7) The ATKT rules for admission for the B.Sc. Course **(Theory and Practical as separate passing head and on calculation fraction, if any, shall be ignored)** shall be as given in the following Table- 3.

Table 3

Admission to Semester	**The student should have attended the Session / term satisfactorily**	**Candidates should have passed at least one half of the passing heads of the following examinations (Theory and Practical as separate passing head and on calculation fraction, if any, shall be ignored)**
1	2	3
B. Sc. Semester I	Semester I and admitted As per para 6 of this Direction	---------
B. Sc. Semester II	Semester II	---------
B. Sc. Semester III	Semester III	One half of the total head prescribed for Sem I and Sem II examination
B. Sc. Semester IV	Semester IV	---------
B. Sc. Semester V	Semester V	a) Passed Sem I & II examination and b) One half of the total head prescribed for Sem III & IV examination
B. Sc. Semester VI	Semester VI	---------

8. a) Without prejudice to the other provisions of Ordinance No. 6 relating to the Examinations in General, the provisions of Paragraph 5, 8, 10 and 31 of the said ordinance shall apply to every candidate.

b) The students admitted to this Degree course shall be governed by the general Ordinances / Directions of the University which are applicable to all the regular or ex-students. These Ordinances includes complete as well as relevant provision of Ordinance No. 1, 2, 6, 7-A, 9, 10, 19, 109, Ordinance No. 30 of 2006, (amended Ordinance No. 4 of 2006), Direction 9 of 2008, Direction 5 of 2004 wherever applicable accordingly AND Direction / Ordinance of ATKT as well as reassessment / provisional admission as issued from time to time.

9. The fee for each Semester examination shall be as prescribed by the University from time to time.

10. Every examinee for the B. Sc. Semester I & II examination shall be examined in:

i) Compulsory English

ii) Any one of the following Languages
Marathi, Hindi, Urdu, Supplementary English, Gujarati, Bengali, Telugu, Sanskrit, French, German, Russian, Persian, Arabic, Pali and Prakrit or Latin

iii) Subjects from any one of the following groups, as indicated in Table 4 given below:

Table 4	
Chemistry, Physics, Mathematics	Biotechnology, Microbiology, Chemistry
Chemistry, Statistics, Mathematics	Mathematics, Statistic, Electronics
Chemistry, Zoology, Botany	Electronics, Computer science, Mathematics.
Chemistry, Zoology, Geology	Mathematics , Physics, Geology
Chemistry, Physics, Geology	Mathematics, Chemistry, Computer science
Chemistry, Botany, Geology	Biotechnology, Zoology, Chemistry
Chemistry, Mathematics, Geology	Biotechnology, Botany, Chemistry
Physics, Mathematics, Statistics	Mathematics, Physics, Information Technology
Chemistry, Biochemistry, Environmental Science	Geology, Mathematics, Computer Science
Chemistry, Environmental Science , Geology	Sericulture, Chemistry, Zoology
Chemistry, Zoology, Microbiology	Sericulture, Chemistry, Botany
Chemistry, Botany, Microbiology,	Chemistry, Geology, Geo-exploration and Drilling Technology
Chemistry, Biochemistry, Botany	Physics, Geology, Geo-exploration and Drilling Technology
Chemistry, Biochemistry, Zoology	Mathematics, Geology, Geo-exploration and Drilling Technology
Chemistry, Biochemistry, Microbiology	Statistic, Geology, Geo-exploration and Drilling Technology
Physics, Mathematics, Electronics	Physics, Mathematics, Geo-exploration and Drilling Technology
Chemistry, Physics, Electronics	Chemistry, Physics, Geo-exploration and Drilling Technology
Chemistry, Zoology, Environmental Science	Mathematics, Physics, Computer Maintenance
Chemistry, Botany, Environmental Science	Mathematics, Electronics, Computer Maintenance
Chemistry, Geology, Environmental Science	Mathematics, Chemistry, Computer Maintenance
Chemistry, Microbiology, Environmental Science	Mathematics , Statistics, Computer Science
Chemistry, Statistics, Computer Science	Chemistry, Biochemistry, Geology
Physics, Mathematics, Electronic Equipment Maintenance	Mathematics, Environmental Science, Computer Maintenance
Chemistry, Zoology, Industrial Fish & Fisheries	Biotechnology, Botany, Biochemistry
Physics, Mathematics, Computer Science	Biotechnology, Zoology, Biochemistry
Physics, Statistics, Computer Science	Biotechnology, Microbiology, Biochemistry
Chemistry, Industrial Chemistry, Mathematics	Sericulture, Zoology, Botany
Biotechnology, Chemistry, Biochemistry	Chemistry, Industrial Chemistry, Botany
Physics, Chemistry, Environmental Science	

11. Every examinee for the B.Sc. Sem-III, IV, V and VI Examination shall be examined in each of the three Science subjects in which he/she has been examined at the B.Sc. Sem-I & II Examination.

12. An examinee who has been successful at the B.Sc. Sem-I & II Examination, may offer an additional subject mentioned in Table 4, not offered by him / her at the B.Sc. Sem-I & II Examination, on his prosecuting a regular course of study for one academic year in that subject. Such an examinee shall not be permitted to take any other examination simultaneously with the examination in the additional subject. The fee for the additional subject shall be as prescribed by the University from time to time.

13. The Scope of the subjects of all semesters of B.Sc. examination shall be as indicated in the respective syllabi in force from time to time. The medium of instruction and examination shall be English, except for the courses in Languages.

14. The maximum marks allotted to each subject and the minimum marks which an examinee must obtain in order to pass the examination shall be as per the Appendix **A** appended to this Direction.

15. The practical examination of all semesters shall be conducted at the end of each semester as indicated in Table 5 given below.

Table 5

S. No	Name of the Examination	Main Examination	Supplementary Examination
1	Semester I, III and V	Winter	Summer
2	Semester II, IV, and VI	Summer	Winter

16. The scheme of awarding internal marks shall be as per Appendix- **B** appended with this Direction.

17. Successful examinees at the B.Sc. Sem-VI Examination who obtained not less than 60% marks (aggregate of Sem-I, II, III, IV, V & VI Examinations taken together, excluding Languages) shall be placed in First Division, those obtaining less than 60% but not less than 45% in Second Division, and all other successful examinees in the Third Division.

Explanation :

Division at the B.Sc. Examination shall be declared on the basis of the marks obtained only in the Science Subjects at the Sem-I, II, III, IV, V & VI Examinations taken together.

18. There shall be no classification of successful examinees at the Sem-I to Sem-V Examinations.

19. An examinee successful in the minimum period prescribed for the examination, obtaining not less than 75% of the maximum marks prescribed in the subject shall be declared to have passed the examination with Distinction in that subject.

Explanation :

(1) Distinction shall be awarded only in the Science Subjects.

(2) Distinction at the B.Sc. Examination shall be awarded on the basis of the marks obtained at the B.Sc. Semester - I, II, III, IV, V and Semester VI Examination taken together.

(3) Distinction shall not be awarded to an examinee availing of the provision of the exemptions and compartments at any of the examination.

20. Provisions of Ordinance No 7-A relating to the Condonation of Deficiency of Marks for passing an examination and compartment as amended up-to-date vide ordinance No. 45 of 1983 shall apply to the examinations under this Direction.

21. (A) The students who have passed B.Sc. Semester VI examination of this University or any other statutory University shall be eligible to seek admission for studying practical of any other optional subjects offered for B.Sc. Degree for simultaneous study of complete three year course for that subject in one year and to appear simultaneously for all parts of examination leading to the degree of Bachelor of Science (additional) in that subject, subject to the following condition. An examinee shall have attended full course of laboratory instructions in a College in the subject in which laboratory work is prescribed. An examinee shall submit a certificate to that effect signed by the Principal of the College.

(B) On securing not less than minimum marks prescribed for the subject / subjects shall be issued a certificate of having passed the examination in the additional subject / subjects as the case may be.

(C) The application for admission to the examination under (A) above shall be submitted to the Registrar not less than three months before the date of commencement of the examination.

22. As soon as possible after the examinations, the Board of Examinations shall publish a list of successful examinees at the B.Sc Sem-I & II; B.Sc. Sem-III & IV and B.Sc. Sem-V & VI Examinations. Such list at the B.Sc. Semester VI Examination shall be arranged in three Divisions. The names of the examinees passing the examination as a whole in the minimum prescribed period and obtaining the prescribed number of places in First or Second Division shall be arranged in Order of Merit as provided in the Examinations in General Ordinance No. 6. While preparing the Merit list for the B. Sc. Examination the marks secured by the candidate in the compulsory languages at their Semester I & II Examination will be taken into consideration in addition to the marks scored by them in their optional subjects.

23. No Person shall be admitted to B.Sc Sem-I, II, III, IV, V and VI Examinations, if he/she has already passed the corresponding or an equivalent examination of any other Statutory University.

24. Successful examinees at the B. Sc. Sem I, II, III, IV, and V Examinations shall be entitled to receive a **Certificate** signed by the **Registrar** and successful examinees at the end of B. Sc. Sem VI examination shall, on payment of prescribed fees, receive a Degree in the prescribed format, signed by the Vice-Chancellor.

25. The provisions of direction no. 3 of 2007 for the award of grace marks for passing an examination, securing higher grade in subject(s) as updated from time to time shall apply to the examination under this direction.

26. Absorption / Matching Scheme:

a. While switching over to semester pattern, the failure students of annual pattern will be given total five (three + two) chances to clear each examination.
   After availing five chances for clearing the examination as per annual pattern, no examination would be held for annual pattern candidates.
b. The candidates who have cleared all the subject heads of first year annual pattern examination shall get admission to third semester directly. However, candidates who are allowed to keep term will not be eligible for admission to third semester unless they clear all the papers / practicals / subject heads of first year annual pattern examination.
c. The candidates who have cleared all the subject heads of second year annual pattern examination shall get admission to fifth semester directly. However, candidates who are allowed to keep term will not be eligible for admission to fifth semester unless they clear all the papers / practicals / subject heads of second year annual pattern examination.
d. For other Statutory University candidates with similar yearly pattern program, point No. 26 ‘b’ and ‘c’ shall be applicable.
e. The scheme of awarding internal marks / practical marks / theory marks / marklist (if any and if required) shall be as per guidelines given in Appendix – C.
f. For other Statutory University candidates with Semester Pattern Bachelor of Science Program – the candidate shall be admitted to the next higher semester provided that Candidate shall have cleared previous semester and R. T. M. Nagpur University Committee constituted from time to time for the purpose shall scrutinize and clear the case on the basis of subject and syllabus contents of his / her previous semester examination of the other Statutory University.
g. **Those students who fail to clear the examination within the available chances (Three + Two) would be bound by absorption / matching scheme as per Appendix – C.**

27. With the issuance of the Direction, the Direction No.2 of 2015 shall stand repealed.

Sd/-
Dr. S. P. Kane
Vice-Chancellor

Nagpur
Date : 2/5/2016

Appendix – A
Teaching & Examination Scheme
Bachelor of Science
Three Year (SIX SEMESTER) DEGREE COURSE

B. Sc. (Semester I and II)

S. No.	Subject	Teaching scheme			Examination scheme								
					Theory					Practical			Total Marks (Th, Pr, IA)
		Th + Tu (Periods)	Pr (Periods)	Total Periods	Duration Hrs	Max Marks Th paper	Max Marks IA	Total	Min Passing Marks	Duration Hrs	Max marks practical	Min passing marks	
1	Compulsory English	4+1	-	4+1	3	60	15	75	30	-	-	-	75
2	Second Language	3	-	3	3	60	15	75	30	-	-	-	75
3	Science subjects excluding Maths (Paper I)	3+ @	-	6+ @	3	50	10	120	48	-	-	-	150
4	Science subjects excluding Maths (Paper II)	3+ @	-		3	50	10			-	-	-	
5	Science subjects excluding Maths (Practical)	-	6	6	-	-	-	-	-	6-8*	30	12	
6	Mathematics (Paper I)	4+1	-	8+2	3	60	15	150	60	-	-	-	150
7	Mathematics (Paper II)	4+1	-		3	60	15			-	-	-	

Note:

1. Th = Theory; Pr = Practical; Tu = Tutorial; IA = Internal Assessment; @ = Tutorials wherever applicable; * = If required, for two days.
2. Minimum marks for passing will be 40% of the total marks allotted to that paper / practical.
3. Candidate has to pass theory papers and practical separately

Point no. 6 & 7 in the above table is applicable only to students offering Mathematics as one of the subjects.

Grand Total of Semester I & II: 450 + 150 each semester = TOTAL – 600 Marks per semester

Contd.

Teaching & Examination Scheme
Bachelor of Science
Three Year (SIX SEMESTER) DEGREE COURSE

B. Sc. (Semester III; IV, V and VI)

S. No.	Subject	Teaching scheme			Examination scheme								
					Theory					Practical			Total Marks (Th, Pr, IA)
		Th + Tu (Periods)	Pr (Periods)	Total Periods	Duration Hrs	Max Marks Th paper	Max Marks IA	Total	Min Passing Marks	Duration Hrs	Max marks practical	Min passing marks	
1	Science subjects excluding Maths (Paper I)	3+ @	-	6+ @	3	50	10	120	48	-	-	-	150
2	Science subjects excluding Maths (Paper II)	3+ @	-		3	50	10			-	-	-	
3	Science subjects excluding Maths (Practical)	-	6	6	-	-	-	-	-	6-8*	30	12	
4	Mathematics (Paper I)	4+1	-	8+2	3	60	15	150	60	-	-	-	150
5	Mathematics (Paper II)	4+1	-		3	60	15			-	-	-	

Note:

1. Th = Theory; Pr = Practical; Tu = Tutorial; IA = Internal Assessment; @ = Tutorials wherever applicable; * = If required, for two days.
2. Minimum marks for passing will be 40% of the total marks allotted to that paper / practical.
3. Candidate has to pass theory papers and practical separately

Point no. 4 & 5 in the above table is applicable only to students offering Mathematics as one of the subjects.

Grand Total of Semester III, IV, V & VI: 450 each semester = TOTAL - 450 Marks per semester

Appendix - B:

Guidelines for Internal Assessment, Theory paper pattern and Practical

1. Each semester shall comprise of minimum 90 teaching days.
2. Every subject (Except Languages and Mathematics) in each semester will comprise
    a. Two theory papers – 50 Marks each
    b. One internal assessment based on the two theory papers for 10 Marks each. Total 20 Marks.
    c. One practical / laboratory work – Total 30 marks
3. For Mathematics
    a. Two theory papers – 60 marks each
    b. One internal assessment based on the two theory papers for 15 marks each. Total 30 marks
4. In addition to the above, Semester I and II will have
    a. One compulsory English paper of 60 marks with 15 marks internal assessment, Total 75 marks.
    b. One second language paper (Marathi, Hindi, Urdu, Supplementary English, Gujarati, Bengali, Telugu, Sanskrit, French, German, Russian, Persian, Arabic, Pali and Prakrit or Latin) of 60 Marks with 15 marks internal assessment, Total 75 marks.

Internal Assessment:

5. The internal assessment shall be done by the College at least 15 days prior to the final examination of each semester. The Marks shall be sent to the University immediately after the Assessment in the prescribed format.
6. Guidelines for Internal Assessment are appended herewith.

    a) The internal assessment marks assigned to each theory paper as mentioned in Appendix - A shall be awarded on the basis of assignments like class test, attendance, project assignments, seminar, study tour, industrial visits, visit to educational institutions and research organizations, field work, group discussions or any other innovative practice / activity.

    b) There shall be one / two assignments (as described above) per Theory paper.

    c) There shall be no separate / extra allotment of work load to the teacher concerned. He/ She shall conduct the Internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.

    d) The concerned teacher / department / college shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.

    e) At the beginning of each semester, every teacher shall inform his / her students unambiguously the method he / she proposes to adopt and the scheme of marking for internal assessment.

    f) Teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD / Principal.

    g) Final submission of internal marks to the University shall be before the commencement of the University Theory Examinations.

Theory Papers:

7. All Theory papers shall be divided into four units.
8. The theory question papers shall be of 3 hours duration and comprise of 5 questions with equal weightage to all units.
9. The pattern of question papers is appended herewith.
    - Each theory paper will be of 50 marks (60 marks for Mathematics and Languages) each.
    - All questions are compulsory and will carry equal marks.
    - Question paper for any theory paper will comprise of five questions of 10 marks (12 marks for Mathematics and Languages) each.
    - Question No. 1 to 4 will be will be from four units each with an internal choice. The questions can be asked in the form of long answer type for 10 marks (12 Marks for Mathematics and Languages) or two questions / short notes of 5 marks each (6 Marks for Mathematics and Languages) or four questions / short notes of 2½ each (3 Marks for Mathematics and Languages).

- Question No. 5 shall be compulsory with three questions / notes of very short answer type from each of the four units having 1 mark each. The student shall have an option of answering any 10 questions out of the 12 questions. In case of Mathematics and Languages, question 5 shall be compulsory with two questions / notes of very short answer type from each unit having 1½ mark each. The student shall answer all the 8 questions.

Practical:

10. Practical exam shall be of 6 to 8 hours duration for one or two days, depending on subject and number of students.
11. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department.
12. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.
13. The certificate template shall be as follows:

C E R T I F I C A T E

Name of the college / institution _

Name of the Department: _

This is to certify that this Practical Record contains the bonafide record of the Practical work of Shri / Kumari / Shrimati _ of _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Semester _ _ _ _ _ _ _ _ _ during the academic year _ _ _ _ _ _ _. The candidate has satisfactorily completed the experiments prescribed by Rashtrasant Tukdoji Maharaj Nagpur University for the subject _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Dated _ _ _ / _ _ _ / _ _ _ _ _

Signature of the teacher who taught the examinee

1. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
2. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Head of the Department

Appendix – C:

1. While switching over to semester pattern, the failure students of annual pattern will be given total five (three plus two) chances to clear each examination.
2. Student has to clear the corresponding semesters from the new syllabus if Candidate does not clear Part I, Part II and Part III from the Annual Pattern (Old Course) in total of five (Three + Two) chances given in Annual Pattern Old Course. Example cases are given in table (Point No 11 of the Appendix C).
3. While switching over from Annual Pattern (Old Course) to Semester Pattern Course, the candidate shall submit his original marklist of Annual Pattern (Old Course) to the R. T. M. Nagpur University for issuance of new marklist of Semester Pattern Course.
4. As per requirement and if necessary, while switching over from Annual Pattern (Old Course) to Semester Pattern Course, the University shall issue Semester Pattern Course marklist in proportion of marks obtained in the Annual Pattern (Old Course).
5. As soon as the candidate enters in the Semester Pattern Course from the Annual Pattern (Old Course) as per the given absorption / matching scheme and successfully completes the course in the Semester Pattern Course, the University shall award revised marklist as per the Semester Pattern Course for a particular semester.
6. In case of any difference in minimum passing marks in the Annual Pattern (Old Course) AND in the Semester Pattern Course, the University shall convert marks proportionately for issuance of marklist in the Semester Pattern Course.
7. If the candidate has cleared theory papers in the concerned subject in the Annual Pattern (Old Course) [Part I / II / III] – Candidate shall be awarded marks in theory papers and internals marks proportionately in the Semester Pattern Course [Semester I, II / III, IV / V, VI].
8. If the Candidate has failed in the theory papers of any subject of the Annual Pattern (Old Course), then the candidate has to appear for theory papers in that subject for both the concerned semesters (Ex. Part I – concerned semesters are Semester I & II). Proportionate internal marks shall be awarded on the basis of marks obtained in the theory papers of semester pattern course in that subject.
9. If the candidate has cleared practical head in the concerned subject in the Annual Pattern (Old Course), the candidate shall be awarded proportionate marks in the Semester Pattern Course.
10. If the Candidate has failed in the practical head of any subject of the Annual Pattern (Old Course), then the candidate has to appear for the practical head in that subject for both the concerned semesters (Ex. Part I – concerned semesters are Semester I & II). Marks shall be awarded on the basis of marks obtained in the practical head of semester pattern course in that subject.
11. **Example cases:**

Old course (Annual Pattern)	**Semester Pattern Course**
If the candidate has cleared all subject heads of part I / part II in the annual pattern (Old Course)	1. The candidate shall be eligible to take admission in semester III / semester V of the semester pattern course.
If the candidate is declared fail in English and zoology (Th / Pract) heads in Part I of the annual pattern after total of five (three + two)	1. Candidate shall appear as an external student for the semester I and II English and Zoology theory papers in the semester pattern. 2. If the candidate has failed in practical head in the annual pattern, the university shall conduct practical examinations for Semester I and II and candidate shall appear for the same as an external candidate to clear practical head in the semester pattern. 3. Once the candidate clears the subjects in the semester pattern, Candidate shall be eligible to take fresh admission to semester III of the semester pattern course. 4. Candidate shall submit his original marklists of annual pattern course to the

chances in the old pattern.	University for Issuance of mark list of semester pattern course. 5. University shall award internal marks in proportion to marks obtained in theory papers. 6. University shall award practical marks (if applicable) in proportion to marks obtained in the annual pattern zoology practical if Candidate has passed.
If the candidate is declared fail in English and zoology (Th / Pract) heads in Part II of the annual pattern after total of five (three + two) chances in the old pattern.	1. Candidate shall appear as an external student for the semester III and IV English and Zoology theory papers in the semester pattern. 2. If the candidate has failed in practical head, the university shall conduct practical examinations for Semester III and IV and candidate shall appear for the same as an external candidate to clear practical head in the semester pattern. 3. Once the candidate clears the subjects in the semester pattern, Candidate shall be eligible to take fresh admission to semester V of the semester pattern course. 4. Candidate shall submit his original mark lists of annual pattern course to the University for Issuance of mark list of semester pattern course. 5. University shall award internal marks in proportion to marks obtained in theory papers. 6. University shall award practical marks (if applicable) in proportion to marks obtained in the annual pattern zoology practical if Candidate has passed
If the candidate is declared fail in English and zoology(Th / Pract) heads in Part III of the annual pattern after total of five (three + two) chances in the old pattern.	1. Candidate shall appear as an external student for the semester V and VI English and Zoology theory papers in the semester pattern. 2. If the candidate has failed in practical head, the university shall conduct practical examinations for Semester V and VI and candidate shall appear for the same as an external candidate to clear practical head in the semester pattern. 3. Once the candidate clears the subjects in the semester pattern, Candidate shall be eligible to get semester pattern degree from the University. 4. Candidate shall submit his original mark lists of annual pattern course to the University for Issuance of mark list of semester pattern course. 5. University shall award internal marks in proportion to marks obtained in theory papers. 6. University shall award practical marks (if applicable) in proportion to marks obtained in the annual pattern zoology practical if Candidate has passed.
If the candidate is declared fail in Maths and Zoology (Th / Pract) heads in Part I but cleared all the heads of part II of the annual pattern after total of five (three + two) chances in the old pattern.	1. Candidate shall appear as an external student for the semester I and II Maths and Zoology theory papers in the semester pattern. 2. If the candidate has failed in practical head, the university shall conduct practical examinations for Semester I and II and candidate shall appear for the same as an external candidate to clear practical head in the semester pattern. 3. Once the candidate clears the subjects in the semester pattern, Candidate shall be eligible to take fresh admission to semester V of the semester pattern course. 4. Candidate shall submit his original mark lists of annual pattern course to the University for Issuance of mark list of semester pattern course. 5. University shall award internal marks in proportion to marks obtained in theory papers. 6. University shall award practical marks (if applicable) in proportion to marks obtained in the annual pattern zoology practical if Candidate has passed.
If the candidate is declared fail in Hindi and Zoology (Th / Pract) in Part II but cleared Part I of the annual pattern after total of five (three +	1. Candidate shall appear as an external student for the semester III and IV Hindi and Zoology theory papers in the semester pattern. 2. If the candidate has failed in practical head, the university shall conduct practical examinations for Semester III and IV and candidate shall appear for the same as an external candidate to clear practical head in the semester pattern. 3. Candidate is also eligible to take fresh admission to semester V of the semester pattern course. 4. However, Candidate shall clear semester III and IV Hindi and Zoology theory papers and practicals (if applicable) in the semester pattern before the candidate is

two) chances in the old pattern.	awarded with degree in semester pattern course. 5. Candidate shall submit his original mark lists of annual pattern course to the University for Issuance of mark list of semester pattern course. 6. University shall award internal marks in proportion to marks obtained in theory papers. 7. University shall award practical marks (if applicable) in proportion to marks obtained in the annual pattern zoology practical if Candidate has passed.

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY
'Established by Government of Central Provinces Education Department by Notification No. 513 dated the 1st of August, 1923 & presently a State University governed by Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017)

FACULTY OF HUMANITIES AND INTER-DISCIPLINARY STUDIES

DIRECTION NO. 31 OF 2020

(Issued under section 12(8) of the Maharashtra Public Universities Act, 2016)

THE ADMISSIONS AND EXAMINATIONS OF STUDENTS LEADING TO THE AWARD OF THE DEGREE OF MASTER OF ARTS (CHOICE BASED CREDIT SYSTEM) (SEMESTER PATTERN), DIRECTION 2020.

Whereas, the Maharashtra Public Universities Act, 2016 (VI of 2017) (hereinafter the Act VI of 2017) has come in to force in the State of Maharashtra, with effect from 1st March 2017, repealing the Maharashtra Universities Act, 1994;

AND

Whereas, the Rashtrasant Tukadoji Maharaj Nagpur University (hereinafter the "University"), hitherto governed by the Maharashtra Universities Act, 1994, is now being governed by the Act (VI of 2017);

AND

Whereas, under section 34 (2) of the Act, VI of 2017, the university shall have only four faculties specified in said section;

AND

Whereas, the composition of each faculty in the university is to be such as may be prescribed by the university and the university has issued Direction No.15 of 2017 prescribing the composition of each faculty in the university;

AND

Whereas, by virtue of the provisions of Direction No.15 of 2017 various subjects and their courses excluding the post graduation courses in the subjects of music and home economics under the former faculties of Arts and Social Sciences are now included in the faculty of Humanities and the post graduation courses of

music and home economics are now included in the faculty of Inter Disciplinary Studies;

AND

Whereas, the university has issued Direction No.10 of 2019 prescribing certain common conditions for all the undergraduate and post graduate programmes/courses in the university;

AND

Whereas, the University Grants Commission, New Delhi vide letter No.D.ONo.F-1-1/2015(CM) dated 8th January 2015 recommended reforms pertaining to the introduction of Choice Based Credit System at the earliest from the academic session 2015-16 to provide option to students and also seamless mobility across the institutions;

AND

Whereas, the Special Task Force Committee in all the Arts subjects had prepared the syllabi and had scheme of examination for the M.A. Courses and recommended starting of the Choice Based Credit System in erstwhile Faculty of Arts from the academic session 2016-17;

AND

Whereas the Hon'ble Vice-Chancellor in exercise of his powers under section 14(7) of the Maharashtra Uniersities Act, 1994(since repealed), on behalf of the Board of Studies and Faculty, had considered, accepted and recommended to the Academic Council, the policy decision regarding introduction of Choice Based Credit System and the draft syllabi of M.A. Semester-I to IV with draft Direction;

AND

Whereas, the Academic Council in its meeting held on 8-6-2016 vide item No.4 (A & B) had considered, accepted and recommended to Management Council introduction of Choice Based Credit System and the draft syllabi for the Master of Arts programme along with the draft Direction;

AND

Whereas, The Management Council in its meeting held on 14-6-2016 vide item No.99 (A & B) had considered and accepted the said draft Direction;

AND

Whereas, Direction No. 31 0f 2019 incorporating the provisions of the lapsed Direction No. 34 of 2017 and also the decision of the Management Council, regarding absorption of the failure students of the old CBS course, in its meeting dt. 10th January 2019 vide item No.56 and also the decisions of the concerned Board of Studies, with respect to the matchable schemes for absorption of failure student of the old CBC courses, in their meetings held between 25th February 2019 to 3rd March 2019 which was approved by the Vice-Chancellor, under section 12(7) of the Act VI of 2017, on behalf of the Faculties of Humanities and Inter-Disciplinary Studies, the Academic Council and the Management Council of the university;

AND

Whereas, Direction No. 31 of 2019 has lapsed by virtue of the provisions of the proviso to section 12(8) of the Act with the expiry of the period of six months as the same could not be converted in to the necessary Ordinance necessitating the issuance of a fresh Direction, incorporating the provisions of the lapsed Direction No. 31 of 2019 with suitable modifications;

Now, therefore, I Dr. Subhash R. Chaudhari, Vice-Chancellor, Rashtrasant Tukadoji Maharaj University Nagpur, in exercise of the powers conferred upon me under provision of section 12(8) of the Maharashtra Public Universities Act, 2016, do hereby issue the following Directions:-

1. This Direction shall be called "**THE ADMISSIONS AND EXAMINATIONS OF STUDENTS LEADING TO THE AWARD OF THE DEGREE OF MASTER OF ARTS (CHOICE BASED CREDIT SYSTEM) (SEMESTER PATTERN), DIRECTION 2020.**"

2. This Direction shall come into force with effect from the date of its issuance;

3. In this Direction unless the context otherwise requires:-

   a. **"ATKT"** means "Allowed to Keep Term" in the higher semester, as per the rules herein.

b. **"Board of Studies"** means Board of studies of the University in the discipline/subjects concerned.

c. **"Course"** means a theory or practical (or the combination of theory and practical) subject, prescribed for any semester and carrying maximum and minimum passing marks, which a student, admitted to the programme of the **Master of Arts (Choice Based Credit System) (Semester Pattern)** has to study in order to become eligible for the award of the Degree under this Direction.

d. **"Credit"** means the unit by which the course work is measured. It is measured in terms of weekly class hours assigned to a Course.

e. **"Credit Point" (CP):** It is the value obtained by multiplying the Grade Point by the Credit i.e. No. of Credits assigned for the course x Grade Points secured for that course.

f. **"Cumulative Grade Point Average (CGPA)"**: CGPA refers to the Cumulative Grade Point Average weighted across all the semesters. It is obtained by dividing total number of credit points in all the semesters by the total number of credits in all the semesters.

g. **"Degree"** means the Degree of **Master of Arts (Choice Based Credit System) (Semester Pattern) w**hich is to be awarded to a student admitted to the programme governed by this Direction on successful completion of the programme.

h. **"Grade Letter"**: It is an index to indicate the performance of a student in a particular course/ Paper. It is the transformation of actual marks secured by a student in a course/paper. It is indicated by a Grade letter O,A,B,C,D,E and F. There is a range of marks for each Grade.

I. **"Grade Point"** : Grade Point is the weightage allotted to each grade letter depending on the marks awarded in a course/paper.

j. **"Programme"** means the academic progrogramme consisting of four semesters, each semester having one or more than one course (subject), leading to the award of the degree of **Master of Arts (Choice Based Credit System) (Semester Pattern)**

k. **"Student"** means a student admitted to the **Master of Arts (Choice Based Credit System) (Semester Pattern)** programme under this Direction.

l. **Semester Grade Point Average (SGPA)**: SGPA indicates the performance of a student in a given Semester. It is based on the total credit points earned by the student in all the courses and the total number of credits assigned to the courses/papers in a Semester.

k. **"University"**: means RashtrasantTukdojiMaharaj Nagpur University, Nagpur

4. Scope:

i) This Direction shall also govern admission of the students to the IIIrd and IVth semesters in the academic session 2018-19 and onward.

ii) It shall govern the Master of Arts programme in the following subjects:

History, economics, Political Science, Sociology Philosophy, Psychology, Geography, Home Economics, Women's Studies & Development, Dr.Ambedkar Thought, Public Administration, Buddhist Studies, Ancient Indian History Culture & Archaeology, Gandhian Thought, Travel & Tourism, Rashtrasant Tukadoji Maharaj Thought, English, Marathi, Hindi, Urdu, Sanskrit, Pali & Prakrit Arabic Persian, Music, Linguistics and other Indian languages.

5. The duration of the M.A.Course shall be of two academic years consisting of four semesters with the university examinations at the end of each semester namely;

a) M.A.Semester I examination.

b) M.A.Semester II examination.

c) M.A.Semester III examination.

d) M.A.Semester IV examination.

6. The theory examination for Semesters-I, II, III and IV shall be conducted by the University and shall be held separately at the end of each semester at such places and dates as may be decided and notified by the University and shall be held as per the schedule given in the Table below.

Table

Sr. No.	Name of the examination	Regular Admitted, External & Ex6Students Examination	Regular Admitted, External & Ex Students Examination
1	M.A.Semester I & III	Winter	Summer
2	M.A.Semester II & IV	Summer	Winter

7. Admission & Eligibility to the Programme:

a) Subject to the compliance with the provisions of this Direction and of other ordinances in force from time to time, an applicant for admission to Semester-I examination shall have passed the Bachelor Degree examination of this university or of any other statutory recognized university as equivalent to the Bachelor Degree of this university.

b) The applicant who has passed Semester-I shall be eligible for admission to Semester-II subject to ATKT rules.

c) The applicant who has passed Semester-II shall be eligible for admission to Semester-III subject to ATKT rules.

d) The applicant who has passed Semester-III shall be eligible for admission to Semester-IV subject to ATKT rules.

8. **ATKT Rules:** The ATKT rules for admission of the students shall be as per the provisions of Direction No.10 of 2019 as renewed and or modified from time to time.

9. Without prejudice to other provisions of Ordinance No. 6, relating to the Examinations in general, provisions of Para 5, 8, 9, 10, 26, 31 and 32 of the said ordinance shall apply to every student admitted to this course.

10. The fees for the tuition, examination, laboratory and under other heads shall be as prescribed by the university from time to time.

11. For the external candidate the internal marks shall be assigned in proportion to the marks scored by the candidate in the external examination conducted by the university.

12. (a) The scope of the subjects shall be as prescribed in the syllabus.

(b) The medium of instruction and examination shall be English/Hindi/ Marathi except language subjects.

13. The number of papers and maximum marks assigned to each paper and minimum marks / grade, an examinee must obtain in order to pass the examination shall be as prescribed in appendices 1 to 8 of this Direction.

14. The examinee at each of the examination shall have option of not being declared successful at the examination in case he / she does not secure a minimum of grade equivalent to 55% marks at the examination. This option will have to be exercised by the candidate every time the application is submitted for any of the examination. Once this option is exercised it shall be binding on the examinee and therefore the candidate will not be allowed to revoke it under any circumstances.

15. The classification of the examinee successful at the end semester examinations and at the end of final semester examination shall be as per the rules and regulations of Choice Based Credit System as prescribed in appendices, appended with this Direction.

16. The provisions of Ordinance No. 3 of 2007 for the award of grace marks for passing an examination, securing higher grade in the subject(s) as updated from time to time shall apply to the examination under this Direction.

17. The names of the successful examinee passing the examination as a whole in the minimum prescribed period and securing the grades equivalent to first and second division shall be arranged in order of merit as provided in ordinance No. 6 relating to examinations in general.

18. Successful examinees at the end of M.A. Semester-IV Examination who obtained CGPA above 7.51 shall be placed in First Division with distinction, those obtaining CGPA from 6.00 to 7.50 shall be placed in First Division, those obtaining CGPA from 4.50 to 5.99 shall be placed in

Second Division and those obtaining CGPA from 4.00 to 4.49 shall be placed in Third Division.

19. No candidate shall be admitted to an examination under this Direction, if he / she has already passed the same examination of this university or of any other university.

20. Successful examinees at the M.A. Semester I, II, III, & IV Examinations shall be entitled to receive a Statement of marks signed by the Director, Board of Examinations and Evaluation of the University and successful examinees at the end of M.A. Semester IV examination shall, on payment of prescribed fees, receive a Degree in the prescribed format, signed by the Vice-Chancellor.

21. This programme is based on Choice Based Credit System and therefore, it will also be regulated by guidelines and regulation given in appendices which are part of this Direction.

22. **Absorption scheme for failure students of the credit based semester pattern:**

a) While switching over to Choice Based Credit System, the failure students of credit based semester pattern will be given **Five** chances to clear the examination from the Winter 2016 of 1st Semester, Summer 2017 of 2nd Semester, Winter 2017 of 3rd Semester and Summer 2018 of 4th Semester.

b) The candidates who have cleared first and second semester of Part I of the Credit Based Semester Pattern examination in the concerned subject shall get admission to Third Semester of the Choice Based Credit System Semester Pattern directly. Similarly the, candidates who are allowed to keep term will also be eligible for admission to Third Semester of the Choice Based Credit System.

c) The failure students of the CBS course who have exhausted the permissible chances under clause (a) shall have to appear in the matching papers as per the scheme given in Appendix-IX onward hereto.

23. **Absorption scheme for failure students of annual pattern:**

a) The candidates who have cleared first year of annual pattern shall get admission to Semester III of the Choice Based Credit System directly. Similarly candidates who are allowed to keep term will not be eligible for admission to Third Semester of the Choice Based Credit System.

b) All Ex and External students of the annual pattern course will have the last chance in winter 2017 examination to successfully complete their course. On failure of such students to successfully complete their course within the permitted time they will have to opt for the Choice Based Credit System (Semester Pattern) by taking admission in the first semester.

24. If an examinee fails to pass the M.A. course, governed by this Direction, within five successive years from the date of his/her first admission to particular programme he/she shall be declared as 'Not fit for the Course' (NFC) and he/she will not be allowed to appear further for any exam of the same course.

25. **Guidelines for Students, Supervisors and Examiners**

i) In each semester the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field/ subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion. The seminar will be open to all the teachers of the department, invitees, and students.

ii) The students should submit the assignment properly bound in two copies to the head of the department. The said shall be evaluated by the concerned supervisor / head of the department.

iii) The marks of the Internal Assessment shall be forwarded to the university within due period through head of the Department. The record of the seminar and assignment should be preserved till the declaration of the final result.

a) The internal assessment marks shall be awarded by the concerned teacher.

b) The internal assessment shall be completed by the College / University at least 15 days prior to the final examination of each semester. The Marks shall be sent to the University immediately after the Assessment in the prescribed format.

26. **General guidelines for Internal Assessment are:**

a) The internal assessment marks assigned to each theory paper as mentioned in Appendix 4 shall be awarded on the basis of assignments like class test, attendance, home assignments, study tour, visit to educational institutions and research organizations, field work, group discussions or any other innovative practice / activity.

b) There shall be one assignment (as described above) per Theory paper.

c) There shall be no separate / extra allotment of work load to the teacher concerned. He/ She shall conduct the internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.

d) The concerned teacher / department / college shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.

e) At the beginning of each semester, every teacher / department / college shall inform his / her students unambiguously the method

he / she propose to adopt and the scheme of marking for internal assessment.

f) Teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD / Principal.

g) Final submission of internal marks to the University shall be before the commencement of the University Theory / Practical examinations whichever is later.

27. Every student of the programme governed by this Direction shall have the option to select any foundation course from the list given in list "B" only in para 31 herein from the academic session 2019-20.

28 One credit course of theory will be of one clock hour per week of 25 marks running for 15 weeks and four credit course of theory will be of four clock hours per week of 100 marks running for 15 weeks.

29 One credit course of practical will consist of two clock hours of laboratory exercise of 25 marks running for 15 weeks and four credit course of practical will consist of eight hours of laboratory exercise of 100 marks running for 15 weeks.

30. **Practical Examination**

i) Each practical carries 100 marks. For the examination, the distribution of the marks shall be as follows:

a. Record / Journal / Internal assessment	: 20 marks – Evaluated by Internal
b. Practical Performance	: 60 marks – Evaluated jointly by External & Internal
c. Viva-voce	: 20 marks - Evaluated by External

NOTE: Practical performance shall be jointly evaluated by the External and Internal Examiner. In case of discrepancy, the External Examiner's decision shall be final.

ii) Practical exam shall be of 3 to 8 hours duration for one or two days, depending on subject and number of students.

iii) The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department.

iv) If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.

v) The certificate template shall be as follows:

CERTIFICATE

Name of the college / institution _____

Name of the Department: _____

This is to certify that this Practical Record contains the bonafide record of the Practical work of Shri / Shrimati / Kumari _____ of M.A.. _____

_____ Semester _____ during the academic year _____. The candidate has satisfactorily completed the experiments prescribed by Rashtrasant Tukdoji Maharaj Nagpur University for the subject _____

Dated ___/___/_____

Signature of the teacher who taught the examinee.

1._____

2._____

Head of the Department

31. General Rules and Regulations regarding pattern of question paper and choice based credit system:

I) Pattern of Question Paper

i) There will be four units in each paper.

ii) Maximum marks of each theory paper will be 80

iii) Question paper will consist of five questions, each of 16 marks.

iv) Four questions will be on four units with internal choice (One question on each unit).

v) Fifth question will be compulsory with questions from each of the four

units having equal weightage and there will be no internal choice.

II) Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

M.A. Program shall consist of four semesters, wherein the student has to complete certain number of credits as indicated in Table 1. Each subject (or course) has fixed number of credits. The types of subject subheads are: Core, Electives, Foundation Course, Seminar and Assignment.

Among the 64 credits which candidate needs to complete and clear for M.A. in any concerned subjects, at least 56 credits must be taken from the parent department where he / she is registered for M.A. Course. The remaining 08 credits may be taken from any other department of university or affiliated colleges offering foundation courses of PG programs.

Table 1: Credit Requirements for Post Graduate Studies-

Post Graduate	Semester	Core	Elective	Found ation	Total Credits
All Subject mention in this Direction Except Practical Subject.	I	08	08	----	16
	II	08	08	----	16
	III	08	04	04	16
	IV	08	04	04	16
		32	24	08	64

Explanatory terms:

i). **Core:** Major theory papers in the concerned subject, as per respective Syllabus

ii). **Elective:** These papers will be specialization in the concerned subject, as per respective Syllabus.

iii). Foundation Course : Student can choose this paper from same or any other subject in the same faculty or any other faculty other than his main subject for post graduation. For example an M.A. Sociology student can take a foundation course paper from Sociology or Political Science or Economics or History or Marathi or Commerce of M.Sc. Math or any other subject as per available in the subject list of the foundation course in the Direction of Faculty and which will be available at nearest of other college/department from his/her college/department. They should earn the credits from the respective college/departments.

III) Subject wise list of M.A. CBCS Foundation Course (same subject) :

The foundation courses mentioned in list "A" are valid only for and till the academic session 2018-19. Thereafter i.e. from the academic session 2019-20 no student shall be allowed to opt for any of the foundation course mentioned in the list "A".

A. Subject wise list of M.A. CBCS Foundation Course (same subject) :

Sr. No.	Name of the subject	Foundation I	Foundation II
1	History	a. India under the sultanate period (1206-1525 A.D.) or b. History of Science and Technology in Pre Colonial India	a. India under the Mughals (1526-1701 A.D.) or b. History of Science and Technology in Colonial India
2	Economics	1. Basic Statistics 2. Issues in Indian Economy 3. Managerial Economics 4. Research in Social Science	1. Money and Banking 2. Economics of Maharashtra 3. Urban & Rural Economy 4. Entrepreneur Development
3	Political Science	1. Public Policy in India 2. Reservation Policy in India 3. Development and Human Rights 4. Human Rights and Indian Constitution	
4	Sociology	a. Rural Society in India b. Urban Society in India c. Social Change in contemporary India d. Introduction Sociology e. Sociology of Environment	a. Rural Society in India Issues and Problems. b. Urbanization in India c. Contemporary Sociology d. Political Sociology e. Sociology of Demography
5	Philosophy	General Philosophy	Philosophy of Conduct
6	Psychology	1. Clinical Psychology Practicum 2. Organization Psychology Practicum 3. Counseling Psychology Practicum	1. Clinical Psychology Practicum 2. Organizational Psychology Practicum 3. Counseling Psychology Practicum

7	Geography	Geographic Information System and Computer Mapping	Remote Sensing Techniques
8	Social work	Introduction to social work profession –I	Application in Social Work Practice-II
9	Home Economics	(Choose any one of the following subjects) a. CB1-Resource Management b. CB-2 Human Development c. CB-3 Food and Nutrition d. CB-4 Textile and Clothing e. CB-5 Home Science Extension Education	(Choose any one of the following subjects) a. CB1-Resource Management b. CB-2 Human Development c. CB-3 Food and Nutrition d. CB-4 Textile and Clothing e. CB-5 Home Science Extension Education
10	Mass Communication	1. Introduction to Mass Communication. 2. Public Relations & Advertising	1. Electronic Media (Radio T.V & Films) 2. News Reporting, Feature Writing & Photo Journalism
11	Women Studies & Development	Select any one i. Women's Education in India. ii. Issues in Women's Empowerment iii Women's Health care in India.	Select any one i. Capacity Building of Women ii. Women's Movement in Vidarbha iii Women in Politics and Governance.
12	Dr. Ambedkar Thought	(Choice given to the students) paper IV a. Research Methodology (A) b. Thought of Tathagat	(Choice given to the students) a. Research Methodology (B) b. Social Movement

13	Public Administration	Select any one 1. Introduction to Public Administration 2. Introduction to Indian Administration 3. E-Governance	select any one 1. Emerging Trends in Public Administration 2. Contemporary issues in Indian Administration 3. Human Rights Administration
14	Rashtrasant Tukadoji Maharaj Thought		
15	Buddhist Studies	Group A : Dr.Ambedkar Thoughts Group B: Basic Principle of Buddhism	Group A : Basic Study of Buddhist Literature. Group B: Buddhist Psychology
16	Ancient Indian History Culture & Archaeology	Cultural Heritage of India	Principles of Museology
17	Gandhian Thought	a. Gandhian Thought-I or b. Gandhian Approach to Rural Devlopment (for Gandhian Thought Students)	a. Gandhian Thought-II or b. Gandhian Approach to Rural Devlopment-II (for Gandhian Thought Students)
18	Library & Information Science	Fundamentals of Library and Information Science	Fundamentals of Information Science.
19	Travel & Tourism	1. Introduction to Travel & Tourism 2. Tourism Services	1. Tourism Resources 2. Tourism Retail Sales Business.

B. List of Foundation Subjects for Post Graduate Courses

Sr.No	Subject	Board	4th Papers of Semester- 3	4th Papers of Semester-4
1	Mathematics	Mathematics	Mathematics-I	Mathematics-II
2	Physics	Physics	Physics-I	Physics-II
3	Chemistry	Chemistry	Chemistry-I	Chemistry-II
4	Bio-Technology (Ad-hoc)	Bio-Technology	Bio-Technology-I	Bio-Technology-II
5	Computer Science	Computer Science & Engineering	Computer Science-I	Computer Science-II
6	Environmental Science	Environmental Science	Environmental Science-I	Environmental Science-II
7	Botany	Botany	Botany-I	Botany-II
8	Zoology	Zoology	Zoology-I	Zoology-II
9	Statistic	Statistics	Statistics-I	Statistics-II
10	Business Management	Business Management	Business Management -I	Business Management –II
11	Accountancy	Account & Statistics	Account & Statistics-I	Account & Statistics-II
12	Managerial Skill	Business Administration & Business Management	Managerial Skills-I	Managerial Skills-II
13	Education Technology & Management Skills	Education Technology & Management Skills	Education Technology & Management Skills-I	Education Technology & Management Skills-II
14	Communication Skill	English	Communication Skills-I	Communication Skills-II
15	Sanskrit	Sanskrit	Sanskrit-I	Sanskrit-II
16	German	Other Foreign Languages	German-I	German-II
17	French	Other Foreign Languages	French-I	French-II
18	Law	Law	Law-I	Law-II
19	Pharmaceutical Sciences	Pharmaceutical Sciences	Pharmaceutical Sciences-I	Pharmaceutical Sciences-II
20	Life skills	Education	Life Skills-I	Life Skills-II
21	Economics	Economics	Economics-I	Economics-II
22	Political Science	Political Science	Political Science-I	Political Science-II
23	Sociology	Sociology	Sociology-I	Sociology-II
24	Psychology	Psychology	Psychology-I	Psychology-II
25	Philosophy	Philosophy	Philosophy-I	Philosophy-II
26	History	History	History-I	History-II
27	Public Administration	Public Admn	Public Admn -I	Public Admn –II

28	Buddhist Studies	Buddhist Studies	Buddhist Studies-I	Buddhist Studies-II
29	Gandhian Thought	Gandhian Thought	Gandhian Thought-I	Gandhian Thought-II
30	Dr. Ambedkar Thought	Dr. Ambedkar Thought	Dr. Ambedkar Thought-I	Dr. Ambedkar Thought-II
31	Rashtrasant Tukdoji Maharaj Thought	Rashtrasant Tukdoji Maharaj Thought	Rashtrasant Tukdoji Maharaj Thought-I	Rashtrasant Tukdoji Maharaj Thought-II
32	Travel & Tourism	Travel & Tourism	Travel & Tourism-I	Travel & Tourism-II
33	Personality Development	Human Development	Personality Development-I	Personality Development-II
34	Cosmetic Technology	Cosmetic Technology	Cosmetic Technology-I	Cosmetic Technology-II
35	Hospitality Management	Hotel Mgt. & Cat. Tech.	Hospitality Mgt. -I	Hospitality Mgt. –II
36	Chemical Engineering	Chemical Engineering	Chemical Engineering-I	Chemical Engineering-II
37	Chemical Technology	Chemical Technology	Chemical Technology-I	Chemical Technology-II
38	Civil Engineering	Civil Engineering	Civil Engineering-I	Civil Engineering-II
39	Electrical Engineering	Electrical Engineering	Electrical Engineering-I	Electrical Engineering-II
40	Mechanical Engineering	Mechanical Engineering	Mechanical Engineering-I	Mechanical Engineering-II
41	Electronics Engineering	Electronics Engineering	Electronics Engineering-I	Electronics Engineering-II
42	Pali Prakrit	Pali Prakrit	Pali Prakrit-I	Pali Prakrit-II

NOTE :

Internal Assessment: The internal assessment of the student for the foundation course in each semester shall be carried out in the department/college/institution where the student has joined for the foundation course. Such department/college/institution shall forward the internal marks of the student for onward transmission to the examination section alongwith internal marks of his other subjects for the concerned semester.

32. Credits: Semester Grade Point Average and Cumulative Grade Point Average:

i) It is a unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work / field work per week. For example a subject with 6-2-6 (L-T-P) means it has 3 Lectures, 1 Tutorial and 6 Practical in a week. This subject will have ten credits (6x1 + 2x½ + 6x½ = 10). If a student is declared pass in a subject, then he/she gets the credits associated

with that subject. Depending on the marks scored in a subject, student is given a Grade. Each grade has got certain grade points as follows:

Letter Grade	O	A+	A	B+	B	C	P	F	Ab
Grade Point	10	09	08	07	06	05	04	0	0

A student obtaining Grade F shall be considered failed and will be required to reappear for the examination.

ii) **Valuation pattern:**

Every credit is for 25 marks and valuation and grade points will be given as per following pattern.

Marks obtained in Theory / Practical of 100 marks	Marks obtained in Theory / Practical of 50 marks	Letter Grade	Grade point
91-100	46-50	O	10
81-90	41-45	A+	09
71-80	36-40	A	08
61-70	31-35	B+	07
51-60	26-30	B	06
41-50	21-25	C	05
= 40	=20	P	04
<40	<20	F	0
Ab	Ab	Ab	0

- **Total marks obtained by the student will be mentioned on the mark sheet along with the grade.**

iii) Computation of SGPA and CGPA

Following is the procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

SGPA (Si) = Σ(Ci x Gi) / Σ Ci

where Ci is the number of credits of the course and Gi is the grade point scored by the student in the course.

Illustration for SGPA

Code	Theory / Practical	Credits	Marks Obtained	Out of	Grade Point	Grade Letter	Credit Point (Credit x Grade Point)
Core	Paper 1	4	84	100	9	O	4x9=36
Core	Paper 2	4	68	100	7	B+	4x7=28

Elective	Paper 3	4	52	100	6	B	4x6=24
Foundation	Paper 4	4	47	100	5	C	4x5=20
	Total	**16**					**108**
		Thus, **SGPA =108/16 = 6.75**					

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

CGPA = Σ (Ci x Si) / Σ Ci

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

Illustration for CGPA

Semester 1	**Semester 2**	**Semester 3**	**Semester 4**
Credit : 16 SGPA: 6.50	Credit : 16 SGPA: 7.83	Credit : 16 SGPA: 5.69	Credit : 16 SGPA: 6.31

Thus,

$$\text{CGPA} = \frac{16 \times 6.50 + 16 \times 7.83 + 16 \times 5.69 + 16 \times 6.31}{64}$$

$$= 104.00 + \frac{125.28 + 91.04 + 100.96}{64} = \frac{421.28}{64} = \mathbf{6.5825} \quad \textbf{i.e. 6.58}$$

The SGPA and CGPA shall be rounded off to 2 decimal points and re ported in the transcripts. Ex. 7.0765 = 7.08 or 6.5168 = 6.52 etc.

Transcript (Format): Based on the above recommendations on Letter grades, grade points and SGPA and CCPA, the HEIs may issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters.

33. Notwithstanding the lapse of Direction No. 31 of 2019 prior to issuance of this Direction all the actions taken by the University or the college conducting/oofering programme governed by this Direction shall be deemed to have been taken in pursuance of the provisions of this Direction and hence shall be binding on all the parties.

34. Any doubt or a question arising out of interpretation or application of any provisions of this Direction shall be referred to the decision of the Vice-Chancellor whose opinion in the matter shall be final and binding on all the parties.

(Dr. Subhash R. Chaudhari)
Vice-Chancellor

Nagpur
Date : 07-12-2020

Appendices-1 to 7

SCHEMES OF EXAMINATIONS OF FACULTY UNDER THE SUBJECT OF HISTORY, , POLITICAL SCIENCE, SOCIOLOGY, PHILOSOPHY, PSYCHOLOGY, GEOGRAPHY, HOME ECOMOMICS, WOMEN'S STUDIES & DEVELOPMENT, DR. AMBEDKAR THOUGHT, PUBLIC ADMINISTRATION, BUDDHIST STUDIES, ANCIENT INDIAN HISTORY CULTURE & ARCHAEOLOGY , GANDHIAN THOUGHT , TRAVEL & TOURISM , RASHTRASANT TUKADOJI MAHARAJ THOUGHT, ENGLISH, MARATHI, HINDI, URDU SANSKIRIT, PALI & PRAKRIT PERSION, MUSIC, FINE ART, LINGUISTICS AND OTHER INDIAN LANGUAGES.

Appendix-1(A)

Semester I & II for M.A. Programme in all subjects except Practical Subject											
Code	Theory	Teaching Scheme (Hours/Week)			Credits	Examination Scheme					
		Th	Int. Ass	Total		Duration in hrs,	Max. Marks		Total	Minimum Passing Marks	
							External marks	Internal Assmnt			
	Paper									Th	Int. Ass
Core	1	4	--	4	4	3	80	20	100	32	08
Core	2	4	--	4	4	3	80	20	100	32	08
Elective /core	3	4	--	4	4	3	80	20	100	32	08
Elective /core	4	4	--	4	4	3	80	20	100	32	08
Total		16	--	16	16		320	80	400	---	---

Note :-1.Subject code and other details as per respective syllabus

2)In addition to the theory papers, students will be required to undertake Practical Work also (6 hours per week). They have to spin 500 grams of cotton during each Semester. Otherwise they will not be allowed to appear for the examination of Gandhian Thought Course.

Appendix-1(B)

Semester III & IV for M.A. Programme in all subjects except Practical Subject												
Code	Theory	Teaching Scheme (Hours/Week)			Credits	Examination Scheme						
		Th	Int. Ass	Total		Duration in hrs,	Max. Marks		Total	Minimum Passing Marks		
	Paper						External marks	Internal Assmnt		Th	Int. Ass	
Core	1	4	--	4	4	3	80	20	100	32	08	
Core	2	4	--	4	4	3	80	20	100	32	08	
Elective	3	4	--	4	4	3	80	20	100	32	08	
Foundation or core	4	4	--	4	4	3	80	20	100	32	08	
Total		16	--	16	16		320	80	400	---	---	

Note :- 1.Subject code and other details as per respective syllabus

2) In addition to the theory papers, students will be required to undertake Practical Work also (6 hours per week). They have to spin 500 grams of cotton during each Semester. Otherwise they will not be allowed to appear for the examination of Gandhian Thought Course.

3) Students should filed work and Intern ship in any women's related NGO (Intern ship report) or Research Project for the M.A fourth semester is compulsory to the Women's Studies Course.

RASHTRASANT TUKDOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

Direction No. 40 of 2016

DIRECTION GOVERNING THE EXAMINATION LEADING TO THE DEGREE OF MASTER OF COMMERCE (CREDIT BASE SEMISTER PATTERN) FACULTY OF COMMERCE

(Issued under section 14(8) of the Maharashtra University Act 1994)

WHEREAS, Maharashtra University act No. xxxv of 1994 has come into force with effect from 22nd July 1994 and has been amended from time to time,

AND

WHERAS, the University Grants Commission, New Delhi vide letter no. D.O. No. F-2/2008/(XI Plan), Dated 31st January 2008 regarding new initiatives under the XI Plan-Academic reforms in the University has suggested for improving quality of higher education and to initiate the Academic reform at the earliest.

AND

WHEREAS, faculty of commerce act its meeting held on 14.2.2012 has decided to update the existing syllabus for award of the degree of Master of Commerce commensurate with the curricula existing in the various universities in India and with a view to include the latest trends in the commerce stream as well as to design it to suit to the needs of the industries and corporate houses,

AND

WHEREAS, University Grants Commission, New Delhi has prescribed the Model Curriculum for award of the Postgraduate degree in the Faculty of commerce and directed to implement the same from the academic session 2012-2013,

AND

WHEREAS, Chairman of all the Board of Studies in the Faculty of Commerce in their meeting held on 24.2.2016 prepared the Scheme of Credit Based Semester pattern for conduct of the M.Com. Examination,

AND

WHEREAS, Board of Studies viz. (1) Business Administration and Business Management, (2) Commerce, (3) Accounts and Statistics, (4) Business Economics and (5) Ad-hoc Board in Computer Application in its meetings held on 24.2.2016 respectively updated the existing syllabi and recommended some modifications in the scheme of examination for post graduate courses,

AND

WHEREAS, Dean of Commerce has consented to the changes in the syllabus and the scheme of examination for the award of M.Com Degree,

AND

WHEREAS the Vice-Chancellor, Nagpur University, Nagpur approved the recommendations so made by the Special Task Committee in the Faculty of Commerce duly concurred by the Coordinator, Faculty of Commerce as required under Section 38 (a) of the Act on

AND

WHEREAS As per the Advice of the Vice Chancellor, Coordinator, Faculty of Commerce & Coordinator, Special Task Committee in the meeting held on 4.1.2016 constituted sub-committee for syllabus restructuring of M.Com with CBCS pattern.

The Sub-committee submitted the Draft Syllabus of M.Com with CBCS pattern in meeting held on 24.02.2016.

AND

WHEREAS, ordinance making involve a time consuming process, Now, therefore, I, Dr. S. P. Kane, Vice-Chancellor, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur in exercise of the powers vested in me under Section 14(8) of the Maharashtra University Act of 1994 do hereby issue the following direction:

- This direction shall be called "DIRECTION GOVERNING THE EXAMINATION LEADING TO THE DEGREE OF MASTER OF COMMERCE (CREDIT BASED CHOICE SYSTEM) FACULTY OF COMMERCE RASHTRASANT TUKDOJI MAHARAJ NAGPUR UNIVERSITY NAGPUR".
- The Direction shall come in to force with effect from the date of its issuance by Honourable Vice-Chancellor.
- The duration of the course shall be of two academic years consisting of the four semesters with university examination at the end of each semester namely
    - M.ComSemesterI Examination
    - M.ComSemesterIIExamination
    - M.ComSemesterIIIExamination
    - M.ComSemesterIVExamination

  The examination shall be held at such places and on such dates which are notified by the University.

I. ELIGIBILITYTO THECOURSE

- The duration of M.Com. Course shall be of Two years consisting Semester-I &II in first year and Semester-III &IV in second year.

- Subject to compliance with the provisions of this direction and of other ordinances in force from time to time, an applicant for admission to this course shall have passed B.Com., B.Com.(ComputerApplication) or B.B.A .Degree examination of Rashtrasant Tukdoji Maharaj Nagpur University or equivalent of any other recognized University.

- TheExaminationsforSemestersI,II,IIIandIVshallbeheldtwiceayearat Suchplacesandonsuchdatesasnotified bythe University.

- The fees for examination shall be as prescribed by the Rashtrasant Tukdoji Maharaj Nagpur University from time to time.

- Applicant for the examination pursuing are regular course of study leading to the Master Degree in Commerce shall not be permitted to join any other course in this University or any other University simultaneously.

- **ATKT Rules** for Admission for the M.Com Course –An unsuccessful examinee at the any semester examination shall be **ALLOWEDTOKEEPTERM in accordance to**

The following table:

Admission to Semester	Candidate should have passed in all the subjects of the following examinations of R.T.M. Nagpur University	Candidate should have passed at least two third of the passing heads of following examinations
I Semester	As provided in Para5 of the direction.	-------
IISemester	---------	---------
IIISemester	----------	Semester I and II taken together i.e. 5 heads
IVSemester	----------	Semester I , II and III taken together i.e.8 heads

For providing teaching facility in the subjects of Foundation and Elective Groups minimum requirement of student is 5.

II. CREDIT SYSTEMOF EVALUATION

- The M.COM. programme shall consist of **Fifteen** Papers or Subjects in old terminology and a project in any of are a related to commerce as opted by the student.

With the issuance of this Direction, The Direction No 1 of 2014 (Credit based Semester Pattern)shall stand repealed.

Sd/-

Nagpur **Dr. S. P. Kane**

Date :21.6.2016 Vice-Chancellor

Subjects offered, contact hours, credits attached and allocation of marks shall be as follows:

APPENDIX-I

Scheme of teaching and examination under credit based semester system for M.Com Course.

Semester-I

CourseCode		Internal /University Exam.	Total Hours	Marks			Credits
				Semester End Exam.	InternalAssessment	Total	
C11	Advanced Financial Accounting	Uni.	60	80	20	100	4
C12	Indian Financial System	Uni.	60	80	20	100	4
C13	Managerial Economics	Uni.	60	80	20	100	4
C14	Marketing Management	Uni.	60	80	20	100	4
	Total		**240**	**320**	**80**	**400**	**16**

Semester-II

Course Code		Internal /University Exam.	Total Hours	Marks			Credits
				Semester End Exam.	Internal Assessment	Total	
C21	Research Methodology	Uni.	60	80	20	100	4
C22	Advanced Cost Accounting	Uni.	60	80	20	100	4
C23	Co-operation	Uni.	60	80	20	100	4
C24	Human Resource Management	Uni.	60	80	20	100	4
	Total		**240**	**320**	**80**	**400**	**16**

Semester-III

Course Code		Internal /University Examination	Total Hours	Marks			Credits
				Semester End Exam.	Internal Assessment	Total	
C31	**Core Group** 1. Advanced Management Accounting	Uni.	60	80	20	100	4
C 32	2. Statistical Techniques	Uni.	60	80	20	100	4
F 33	**Foundation Group- I** Direct Taxes **OR** Computer Application in Business	Uni.	60	80	20	100	4
E34	**Elective Group-I** Entrepreneurship Development **OR** Service Sector Management	Uni.	60	80	20	100	4
	Total		**240**	**320**	**80**	**400**	**16**

Semester-IV

Course Code		Instruction Hours	Marks			Credits
			Semester EndExam.	InternalAssessment	Total	
C41	**Core Group** International Business Environment	60	80	20	100	4
C42	Project	60	100	-	100	4
F43	**Foundation Group- II** Indirect Taxes **OR** Operations Research	60	80	20	100	4
E44	**Elective Group-II** E-Commerce **OR** Company Law	60	80	20	100	4
	Total	**240**	**340**	**60**	**400**	**16**

Summary of the Total Marks and Credits

Sr. No.		Instruction Hours	Marks			Credits
			Semester End Exam.	Internal Assessment	Total	
1	Semester–I	240	320	80	400	16
2	Semester–II	240	320	80	400	16
3	Semester–III	240	320	80	400	16
4	Semester–IV	240	340	60	400	16
Total		**960**	**1300**	**300**	**1600**	**64**

- The Semester End written examination of all subjects shall be conducted by the University.
- The performance of the learners will be evaluated in two components ,One component will be the continuous assessment by the College/Department (**Internal assessment**) carrying 20% marks and the second component will be the **Semester wise end Examination** carrying 80% marks. The allocation of marks for the Internal Assessment and Semester end Examination for all subjects except Project will be as shown below:

1a	Two periodical class tests	08 marks
1b	An assignment/ Viva/ Group Discussion /Seminar based on curriculum to be assessed by the teacher concerned	08 marks
1c	Over all conduct as a responsible learner	04 marks
1	**Internal assessment Total marks**	**20**
2	**Semester wise End Examination marks**	**80**
	Total marks per subject	**100**

M.COM. Examination Semester–I

Subject	Paper	Maximum Marks	Minimum Passing Marks
1. Advanced Financial Accounting	University Paper	80	
	Internal Assessment	20	
	Total	100	40
2. Indian Financial System	University Paper	80	
	Internal Assessment	20	
	Total	100	40
3.Managerial Economics	University Paper	80	
	Internal Assessment	20	
	Total	100	40
4. Marketing Management	University Paper	80	
	Internal Assessment	20	
	Total	100	40

M.COM. Examination Semester–II

Subject	Paper	Maximum Marks	Minimum Passing Marks
1. Research Methodology	University Paper	80	
	Internal Assessment	20	
	Total	100	40
2. Advanced Cost Accounting	University Paper	80	
	Internal Assessment	20	
	Total	100	40
3.Co-operation	University Paper	80	
	Internal Assessment	20	
	Total	100	40
4. Human Resource Management	University Paper	80	
	Internal Assessment	20	
	Total	100	40

M.COM. Examination Semester–III

Subject	Paper	Maximum Marks	Minimum Passing Marks
Core Group **1. Advanced Management Accounting**	University Paper	80	
	Internal Assessment	20	
	Total	100	40
2 Statistical Techniques	University Paper	80	
	Internal Assessment	20	
	Total	100	40
Foundation Group **3. Direct Taxes OR** **Computer Application in Commerce**	University Paper	80	
	Internal Assessment	20	
	Total	100	40
4.Entrepreneurship Development OR Service Sector Management	University Paper	80	
	Internal Assessment	20	
	Total	100	40

M.COM. Examination Semester–IV

Subject	Paper	Maximum Marks	MinimumPassing Marks
1. International Business Environment	University Paper	80	40
	Internal Assessment	20	
	Total	100	
2.Project	Project work (Evaluation by External Examiner)	50	20
	Project work (Evaluation by Internal Examiner)	50	20
3. Indirect Taxes **OR** **Operations Research**	UniversityPaper	80	40
	InternalAssessment	20	
	Total	100	
3.Entrepreneurship Development **OR** **Company Law**	UniversityPaper	80	40
	InternalAssessment	20	
	Total	100	

- Marks of internal assessment awarded on the basis of tests, assignment etc as determined by the teacher in the respective subject and moderated by the Head of the University Department/Principal and shall be communicated to the University before the commencement of the Semester End examinations.
- Project Work will be compulsory for each student appearing at the semester-IV(M.Com.) Examination.

Project shall carry 100 marks as follows:

	Marks
Project work	50
Viva-voce	50
TOTAL	100

- For Project work a batch of **TWENTY** students per guide /supervisor has to be allotted by the respective College/ University Department.

- A copy of Project work (Printed) shall be submitted to College/ University Department. Fifteen Days prior to the date of commencement of Semester-IV Examination, which will be retained by the college/Department for internal evaluation purpose.

- A Candidate shall submit with his/her project work, a certificate from the Guide to the effect that the candidate has satisfactorily completed the Project work and that the Project work is the result of the candidate's own work.

- Candidate shall submit his declaration that the Project is the result of his own research work and the same has not been previously submitted to any examination of this University or any other University. The Project shall be liable to be rejected and /or cancelled if found otherwise.

- The Project work shall be evaluated through seminar and Viva-voce at the College/ Department by one internal examiner appointed by the Principal/Head of the Department and one external examiner appointed by University.

Project shall carry 100 marks	**Marks**	
	Maximum	**Minimum Passing Marks**
Project work (Evaluation by External Examiner)	50	20
Project work (Evaluation by Internal Examiner)	50	20
Total	100	40

APPENDIX-II

I. GENERAL RULES AND REGULATIONS

The scope of the subject, percentage of passing in theory and project will be governed as per following rules:

- In order to pass at the Semester I, II, III & IV examinations an examinee shall obtain not less than 40% marks in each paper. This is to say that out of total 100 marks student should score 40 marks jointly in university examination (80 Marks) and internal examination (20 marks) except in project of IV Semester. The examinee shall have to obtain minimum 40 marks out of 100 in evaluation of project and 50% (200 out of 400 Marks) aggregate in each Semester wise End Examination.
- The results of successful candidates at the end of semester-IV shall be classified on the basis of aggregate marks obtained in all the four semesters.
- The candidates who pass all the semester examinations in the first attempt are eligible for ranks.
- The results of the candidates who have passed the Semester-IV examination but not passed the lower semester examinations shall be declared as NCL (not completed lower semester examinations). Such candidates shall be eligible for the Degree only after successful completion of all the lower semester examinations.
- Percentage of marks for declaring class:
  Distinction- 75%(and above.
  First Class- 60% and above but less than 75%.Second
  Class- 50% and above but less than 60%.
- An unsuccessful examinee at the any semester wise end examination shall be eligible for re-examination on payment of a fresh Examination fee prescribed by the University.

II.TEACHING NORMS FOR THEORY PAPERS AND PROJECT:

- .For all Theory Papers there shall be **FOUR Periods Per week per Subject of One Hourduration** each. Each Theory Paper must cover minimum 60 Clock Hours of Teaching and 240Clock Hours per Semester for all the 4 Papers. One Credit subject of Theory will be of 1 Clock Hour per week of 25 marks running for 15 weeks and 4 Credit Course of Theory will be of 4 Clock Hours per week of 100 Marks running for 15 weeks.
- For Project work/Research work a batch of Maximum 20 students per guide /supervisor has to be allotted by the College/ University Department. FOUR periods per week of one hour duration shall be the work load allotted for project guidance for 20 students.
- The Project guide /supervisor must possess M.Phil. or Ph.D. degree of Faculty of Commerce or should be a Full time approved Teacher
- No person shall be admitted to this Programme, if he has already passed the same Programme or an Programme of any other statutory University (which has been recognized as equivalent to this programme.)
- A candidate who fails in any of the semester examinations may be permitted to take the examinations again at a subsequent appearance as per the syllabus and scheme of examination in vogue at the time the candidate took the examination for the first time. This facility shall be limited to the following two years.
- Examinee successful at the Semester I, II, III and IV examinations shall, on payment of the prescribed fee, receive a Degree in the prescribed form signed by the Vice-Chancellor.
- Qualification of Teacher shall be as per U.G.C. and State Government norms.

APPENDIX- III

Rashtrasant Tukdoji Maharaj Nagpur University

I. SYLLABUS FORM.COM.EXAMINATION

Semester–I

Advanced Financial Accounting
Indian Financial System
Managerial Economics
Marketing Management

Semester–II

Research Methodology
Advanced Cost Accounting
Co-operation
Human Resource Management

Semester–III

Core Group	1. Advanced Management Accounting
	2. Statistical Techniques
Foundation Group I	3. Direct Taxes **OR** Computer Application in Commerce
Elective Group	4. Entrepreneurship Development **OR** Service Sector Management

Semester–IV

Core Group	1. International Business Environment
	2. Project
Foundation Group II	3. Indirect Taxes **OR** Operations Research
Elective Group	4. E - Commerce **OR** Company Law

II. CONVERSION OF MARKS TO GRADES AND CALCULATIONS OF GPA (GRADE POINT AVERAGE) AND CGPA (CUMULATIVE GRADE POINT AVERAGE) :

In the Credit and Grade Point System, the assessment of individual Subjects in the concerned examinations will be on the basis of marks only, but the marks shall later be converted into Grades by some mechanism wherein the overall performance of the Learners can be reflected after considering the Credit Points for any given course. However, the overall evaluation shall be designated in terms of Grade. There are some abbreviations used here that need understanding of each and every parameter involved in grade computation and the evaluation mechanism. The abbreviations and formulae used are as follows:-

Abbreviations and Formulae Used

G : Grade
GP : Grade Points
C : Credits
CP : Credit Points
CG : Credits X Grades (Product of credits & Grades)
SGPA = ΣCG: Sum of Product of Credits & Grades points / ΣC: Sum of Credits points
SGPA : Semester Grade Point Average shall be calculated for individual semesters. (It is also designated as GPA)
CGPA : Cumulative Grade Point Average shall be calculated for the entire Programme by considering all the semesters taken together.
While calculating the CG the value of Grade Point 1 shall be consider Zero (0) in case of learners who failed in the concerned course/s i.e. obtained the marks below 40. After calculating the SGPA for an individual semester and the CGPA for entire programme, the value can be matched with the grade in the Grade Point table as per the Five (05) Points Grading System and expressed as a single designated GRADE such as O,A,B,C,, F.(Fail).

Marks	Grade	Grade Points
75& above	O (Outstanding)	10
65-74	A (Very Good)	09
55-64	B (Good)	08
50-54	C (Average)	07
49 & Below	F (Fail)	0Failed

Note: -

- Consider Grade Points equal to Zero for (C x G) calculations of failed Learner/s in the concerned course/s.
- If the learner fails to score 200 out of 400 marks in aggregate then the subjects in which he/she has scored 50 or more marks shall be exempted. He/she shall have to appear for all subjects in which he/she has failed to score 50 or more marks. In such case his/her internal evaluation marks out of 20 shall be retained and he/she shall have to appear for Semester End examination of 80 marks and shall have to score-
    - More than 40% marks including internal marks scored in each of the subject in which he/she has failed to score 50 or more marks.

    AND

    - He /she shall have to score a total of 200 marks out of 400 in aggregate after adding up of the marks scored in exempted subject/subjects.

- Total marks (Internal + Semester End Examination) obtained by the student shall be converted into Grades and Five Point Grade points as above.

The illustration for the conversion of marks into grades in a course and semester
Illustrations of Calculation:- Pass

Subjects	Max.MarksSemester EndExam	Max.MarksInternal	TotalMaximumMarks	Total Minimum Marks	Marks Obtained Internal	TotalMarks Obtained	Grade(G)	Gradepoints(GP)	Credit oftheCourse(C)	(Credit) X (Grade points)(CX GP)	SGPA=ΣCG/ΣC
C-11	80	20	100	40	20	60	B	8	4	32	**SGPA** =136/16 =8**.5** **GradeA** **RESULT =PASS**
C-12	80	20	100	40	17	50	C	7	4	28	
C-13	80	20	100	40	15	75	O	10	4	40	
C-14	80	20	100	40	18	70	A	9	4	36	
Total	**320**	**80**	**400**	**160**	**70**	**255**	**--**	**34**	**16**	**136**	

Illustrations of Calculation:- Fail

Subjects	Max.MarksSemester EndExam	Max.MarksInternal	TotalMaximumMarks	Marks ObtainedSemesterEnd Exam	MarksObtained Internal	TotalMarks Obtained	Grade(G)	Gradepoints(GP)	Credit oftheCourse(C)	(Credit) X (Grade points)(CX GP)	SGPA=ΣCG/ΣC
C-31	80	20	100	28	12	40	F	0	4	00	**SGPA** =72/16 =4**.5** **GradeF** **RESULT =FAIL**
C-32	80	20	100	31	10	41	F	0	4	00	
C-33	80	20	100	40	20	60	B	8	4	32	
C-34	80	20	100	60	15	75	O	10	4	40	
Total	**320**	**80**	**400**	**159**	**57**	**216**	**--**	**18**	**16**	**72**	

Illustration for calculating CGPA

		MaximumSemester EndExam.	ObtainedatSemesterEnd Exam.	MaximumInternalAssessment	Obtainedat InternalAssessme	Total	ObtainedTotal	SGPA	TotalCreditPoints	SGPA X TotalCreditPoints	CGPA
1	Semester–I	320	185	80	70	400	255	9.12	16	146	**CGPA=596/64=9.3125 GRADE=O**
2	Semester–II	320	233	80	60	400	293	9.5	16	152	
3	Semester–III	320	185	80	70	400	255	9.12	16	146	
4	Semester–IV	320	233	80	60	400	293	9.5	16	152	
Total		1280	836	320	260	1600	1096	--	64	596	

Note:
According to traditional method the percentage would be = (1096/1600) x 100 = 68.5, and according to CGPA calculation Grade is O which is equivalent to 75-100 percent.

Provision of Direction No.44 of 2001 governing the award of grace marks for passing an examination, securing higher Grades shall apply to the examination

III. REJECTION OF RESULT:

- The candidate shall have an option of being NOT DECLARED SUCCESSFUL in either of the semester end examination if he/she fails to secure minimum 55% aggregate marks in that semester. This option can be opted only through prescribed format forming a part of Examination application form for semester end examination. It shall be applicable only to 80 marks Semester end examination and the internal evaluation marks out of 20 shall not be changed/ altered in any case. If the candidate opts for this option then it shall be irrevocable.
- The candidate who fails in one or more subjects of a semester may be permitted to reject the result of the whole examination of that semester. Rejection of result subject-wise shall not be permitted. A candidate who rejects the results shall appear in the examination of that semester in the subsequent examination.
- Rejection shall be exercised only once in each semester and the rejection once exercised cannot be revoked.
- Application for rejection along with payment of the prescribed fee shall be submitted to the University through the college along with the original statement of marks within 30 days from the date of publication of the result.
- The candidate who rejects the result is eligible for only class and not for ranking.

IV. IMPROVEMENT OF RESULT::

- The candidate who has passed in all the papers of a semester may be permitted to improve the result by reappearing for the whole examination of that semester.
- The reappearance shall be permitted only once in each semester.
- The reappearance for the examination of any semester is permitted during the subsequent examination of that semester.
- Application for reappearance along with payment of prescribed fee shall be submitted to the University through the college along with the original statement of marks within 30 days from the date of publication of the result.
- The candidate passes in all the subjects in the reappearance, higher of the two aggregate marks secured by the candidate shall be awarded to the candidate for that semester. In ease the candidate fails in the reappearance, candidate shall retain the first appearance result.
- A candidate who has appeared for improvement is eligible for class only and not for ranking.
- Internal assessment marks shall be shown separately in the marks card. A candidate who has rejected the result or who, having failed, takes the examination again or who has appeared for improvement shall retain the internal assessment marks already obtained.

V. GUIDELINES FOR SETTING QUESTION PAPERS:

- .The question paper should be set in such a manner so as to cover the complete syllabus as prescribed by the University.
- .The numerical questions in any of the subjects shall be set in ENGLISH only and the candidate shall have to answer such questions in ENGLISH only. The candidate may answer non-numerical questions in ENGLISH, MARATHI or HINDI.
- The duration of the Semester wise End Examination shall be 3.00 Hours per course.
- The Question paper for all subjects of all semesters except Project of semester IV shall comprise of 5 Questions of 16 marks each.
- The internal evaluation of all subjects shall be done at College/ Department by the respective subject teacher.

APPENDIXIV

I. SUBJECTS FOR M.Com. EXAMINATION

Semester –I

Advanced Financial Accounting
Indian Financial System
Managerial Economics
Marketing Management

Semester –II

Research Methodology
Advanced Cost Accounting
Co-operation
Human Resource Management

Semester–III

Core Group	1. Advanced Management Accounting
	2. Statistical Techniques
Foundation Group	3. Direct Taxes **OR** Computer Application in Commerce
Elective Group	4. Entrepreneurship Development **OR** Service Sector Management

Semester–IV

Core Group	1. International Business Environment
	2. Project
Foundation Group	3. Indirect Taxes **OR** Operations Research
Elective Group	4.E - Commerce **OR** Company Law

II.ABSORPTION SCHEME

Sr. No.	SUBJECT OF OLD COURSE BEFORE 2012-13	ALTERNATIVE SUBJECT OF NEW COURSE2012-13
1.	Management Concepts and Organizational Behavior	Human Resource Management
2	Advanced FinancialAccounting	Advanced Financial Accounting
3.	Managerial Economics	Managerial Economics
4.	Business Tax And Tax Planning	Tax Procedure And Practice
5.	E-Commerce	Computer Application In Commerce
6.	Marketing Management	Marketing Management
7.	Industrial Economics	Managerial Economics
8.	Agriculture Economics And Co-Operation	Co-Operation And Rural Development
9.	Public Finance	Managerial Economics
10.	Advanced Cost Accounting	Advanced Cost Accounting
11.	Financial Institutions and Markets	Indian Financial System
12	Securities Analysis And Portfolio Management	Indian Financial System
13.	Advertising And SalesManagement	Marketing Management and
14.	International Marketing	International Business Environment
15.	International Business Environment And Marketing	International Business Environment
16.	Foreign Trade Policy, Procedure	International Business Environment And Documentation
17.	Business Environment Domestic And International	International Business Environment
18.	Banking And Insurance Law And Practice	Service Sector Management
19.	Advanced Management Accounting	Advanced Management Accounting
20.	Computer Application In Business	Computer Application In Commerce
21.	Financial Management	Advanced Management Accounting
22.	Statistical Analysis	Statistical Techniques
23.	Applied Operations Research	Statistical Techniques
24.	Dissertation	Project
25.	Economics of Labor	Managerial Economics
26.	Advanced Banking	Service Sector Management

The studentsof old course shall be given 05 attempts to pass their examination with old course starting from implementation of New Course.

I. ABSORPTIONSCHEME FOR COURSE AFTER 2012-13

Sr. No.	SUBJECT OF OLD COURSE AFTER 2012-13	ALTERNATIVE SUBJECT OF NEW COURSE OF 2016-17
1.	Advanced Financial Accounting	Advanced Financial Accounting
2	Indian Financial System	Indian Financial System
3.	Managerial Economics	Managerial Economics
4.	Marketing Management	Marketing Management
5.	Research Methodology	Research Methodology
6.	Advanced Cost Accounting	Advanced Cost Accounting
7.	Co-operationand Rural Development	Co-operation
8.	Human Resource Management	Human Resource Management
9.	Advanced Management Accounting	Advanced Management Accounting
10.	TaxProcedures&Practice	Direct Taxes
11.	Computer Application in Commerce	Computer Application in Commerce
12	Service Sector Management	Service Sector Management
13.	Statistical Techniques	Statistical Techniques
14.	International Business Environment	International Business Environment
15.	Entrepreneurship Development	Entrepreneurship Development
16.	Project	Project

The students of old course shall be given 05 attempts to pass their examination with old course starting from implementation of New Course.

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR
FACULTY OF SCIENCE AND TECHNOLOGY
DIRECTION NO. 5 OF 2018

DIRECTION RELATING TO THE EXAMINATION LEADING TO THE DEGREE OF MASTER OF SCIENCE, SEMESTER PATTERN (CHOICE BASED CREDIT SYSTEM) AND DEGREE OF MASTER OF SCIENCE AND TECHNOLOGY (APPLIED GEOLOGY). SEMESTER PATTERN, (CHOICE BASED CREDIT SYSTEM) (FACULTY OF SCIENCE & TECHNOLOGY)

(Issued under Section 12(8) of the Maharashtra Universities Act, 2016)

Whereas, Maharashtra Universities Act, 2016 (hereinafter referred to as Act) has come into force from 2016-17 and was amended from time to time,

AND

Whereas, the Board of Studies (Co-Ordinators of the Task Force) in all the Science subjects in their meeting held during 6th Nov 2017 prepared the syllabi, scheme of examination and absorption scheme for the M. Sc. and M. Sc. (Tech) Applied Geology course,

AND

Whereas, the Dean of faculty of Science and Technology, Dr. H. D. Juneja has considered, accepted and recommended to the Vice-Chancellor M. Sc. Semester-I to IV (Semester I to VI for M. Sc. (Tech) Applied Geology) with draft direction and other details.

AND

Whereas, ordinance making is a time consuming process, therefore, I, Dr. S. P. Kane, Vice Chancellor Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur in exercise of powers vested under Section 12(8) of the Act do hereby issue the following Direction.

1. This Direction may be called **"Direction relating to examinations leading to the Degree of Master of Science, Semester Pattern (Choice Based Credit System) and Degree of Master of Science and Technology (Applied Geology), Semester Pattern, (Choice Based Credit System)"**
2. The direction shall come into force from the date of its issue by Hon'ble Vice Chancellor and shall remain in force till the relevant ordinance comes into being in accordance with the provisions of the Act.
3. The duration of the M. Sc. course shall be of two academic years consisting of four semesters with the University examinations at the end of each semester namely:
    a) M. Sc. Semester I Exam
    b) M. Sc. Semester II Exam
    c) M. Sc. Semester III Exam
    d) M. Sc. Semester IV Exam
4. The duration of the M. Sc. (Tech) Applied Geology course shall be of three academic years consisting of six semesters with the University examinations at the end of each semester namely:
    a) M. Sc. Semester I Exam
    b) M. Sc. Semester II Exam
    c) M. Sc. Semester III Exam
    d) M. Sc. Semester IV Exam
    e) M. Sc. Semester V Exam
    f) M. Sc. Semester VI Exam
5. The theory examination of Semester-I, II, III, IV, V and VI shall be conducted by the University and shall be held separately at the end of each semester at such places and dates as may be decided and notified by the University and shall be held as per the schedule given in Table below.

Sr. No.	Name of the examination	Main Examination	Supplementary Examination
1	Semester I, III & V	Winter	Summer
2	Semester II, IV&VI	Summer	Winter

ELIGIBILITY TO THE COURSE:

6. Subject to their compliance with the provisions of this direction and of other ordinances in force from time to time, the following applicant candidates shall be eligible for the admission to Master of Science and examinations theirof

A	For M. Sc. (Physics) Semester-I	For admission to the M. Sc. Semester I in Physics, a candidate shall have offered Physics as one of the subjects at the qualifying B.Sc. Examination.
B	For M. Sc. (Chemistry) Semester-I	For admission to the M. Sc. Semester I in Chemistry, a candidate shall have offered Chemistry / Industrial Chemistry as one of the subjects at the qualifying B.Sc. Examination.
C	For M. Sc. (Mathematics) Semester-I	For admission to the M. Sc. Semester I in Mathematics, a candidate shall have offered Mathematics as one of the subjects at the qualifying B.Sc. Examination.
D	For M. Sc. (Statistics) Semester-I	For admission to the M. Sc./M.A. Semester I in Statistics, a candidate shall have offered Statistics/Maths as one of the subjects at the qualifying B.Sc./B.A. Examination.
E	For M. Sc. (Computer Science) Semester-I	For admission to the M. Sc. Semester I in Computer Science, a candidate shall have offered Computer Science as one of the optional subjects of study and examination at B.Sc. degree or B.Sc./ B.E. examination with Post B.Sc. diploma course in Computer Science and Application of RTM Nagpur University or any other statutory university or B.Sc. with optional subjects Computer Maintenance / B.Sc. (Information Technology) / B.C.A.
F	For M. Sc. (Information Technology) Semester-I	For admission to the M. Sc. Semester I in Information Technology, a candidate must have Mathematics at 10+2 level and shall have passed B.Sc. (Computer Science) / B.Sc. (Information Technology) / B.Sc. (with Information Technology as the optional subject) / Bachelor of Computer Application (BCA)/ B.Sc. with optional subjects Mathematics, Computer Maintenance, Computer Science / B.Sc. with Electronics / Computer Maintenance as one of the subject .
G	For M. Sc. (Electronics) Semester-I	For admission to the M. Sc. Semester I in Electronics, a candidate shall have offered Electronics / Computer Maintenance as one of the subjects at the qualifying B.Sc. Examination.
H	For M. Sc. (Botany) Semester-I	For admission to the M. Sc. Semester I in Botany, a candidate shall have offered Botany as one of the subjects at the qualifying B.Sc. Examination / B.Sc. (Agriculture) with Botany is one of the subject.
I	For M. Sc. (Zoology) Semester-I	For admission to the M. Sc. Semester I in Zoology, a candidate shall have offered Zoology as one of the subjects at the qualifying B.Sc. Examination.
J	For M. Sc. (Microbiology) Semester-I	For admission to the M. Sc. Semester I in Microbiology, a candidate shall have offered Microbiology / Biotechnology as a subject of study and examination at B.Sc. degree.
K	For M. Sc. (Biochemistry) Semester-I	For admission to the M. Sc. Semester I in Biochemistry, a candidate shall have offered Chemistry and Biochemistry as subjects of study and examination at B.Sc. degree.
L	For M. Sc. (Biotechnology) Semester-I	For admission to the M. Sc. Semester I in Biotechnology, a candidate shall be all Life Science graduates / Veterinary / Fishery Sciences / Pharmacy / Engineering Technology / Medicine (MBBS) / B.D.S. graduates / B.Sc. Agriculture.
M	For M. Sc. (Environmental Science) Semester-I	For admission to the M. Sc. Semester I in Environmental Science, a candidate shall have offered Environmental Science as one of the subjects at the qualifying B.Sc. Examination and B.Sc. Agriculture Science but having Environmental Science is one of the subject.
N	For M. Sc. (Molecular	For admission to the M. Sc. Semester I in Molecular Biology and Genetic Engineering, the candidates who have passed the B.Sc.

	Biology and Genetic Engineering)	Examination in at least second division with any one or more subjects of life sciences / biological sciences / candidates who have passed B.Sc. with Biotechnology as one of the subjects in second division / candidates who have passed the B. Pharm. Examination in at least second division / candidates who have passed the graduation degree in agriculture / fisheries / veterinary sciences Examination in at least second division.
O	For M. Sc. (Geology) Semester-I	For admission to the M. Sc. Semester I in Geology, a candidate shall have offered Geology as one of the subjects at the qualifying B.Sc. Examination.
P	For M. Sc. (Tech) Applied Geology Semester-I	For admission to the M. Sc. (Tech) Semester I in Applied Geology, a candidate shall have offered Geology as one of the subjects at the qualifying B.Sc. Examination.
Q	For M. Sc. (Medicinal Plants) Semester-I	For admission to the M. Sc. Semester I in Medicinal Plants, a candidate shall have offered Botany as one of the subjects as one of the subjects at the qualifying B.Sc. Examination and any one of the following: Zoology, Chemistry, Biochemistry, Horticulture, Biotechnology, Microbiology and Agricultural Microbiology OR B. Sc. Agriculture, B.A.M.S., B.H.M.S., and B. Pharm.

Candidates shall have passed any one of the above examinations from Rashtrasant Tukadoji Maharaj Nagpur University or any other statutory University of India or abroad, recognized by the UGC or any other concerned apex regulatory authority / body of India.

7) Semester Examinations

A	M. Sc. Semester I Examination	Students who have fulfilled the eligibility criteria as mentioned in Section 6 and have been admitted to this course in Semester I.
B	M. Sc. Semester II Examination	Students who have been admitted to this course in semester II.
C	M. Sc. Semester III Examination	Students who have been admitted to this course in semester III.
D	M. Sc. Semester IV Examination	i) Students who have been admitted to this course in semester IV. Every student shall submit two copies of the project report (typed and properly bound) for the Fourth Semester to the Concerned Department at least one month prior to the commencement of the final practical examination through the Head of the Department / Centre / the Principal of the college concerned along with the certificate signed by the supervisor and declaration by the candidate towards original work which is not submitted to any university or organization for award of the degree. The scheme/ guidelines for the students and supervisors regarding Project Work Report are given in Appendix 04.

(Note: Subject to the Rules of ATKT as mentioned in para 9 of this direction)

8) [M. Sc. (Tech) Applied Geology]

A	M. Sc. (Tech) Applied Geology] Semester I Examination	Students who have fulfilled the eligibility criteria as mentioned in Section 6 and have been admitted to this course in Semester I.

B	M. Sc. (Tech) Applied Geology] Semester II Examination	Students who have been admitted to this course in semester II.
C	M. Sc. (Tech) Applied Geology] Semester III Examination	Students who have been admitted to this course in semester III.
D	M. Sc. (Tech) Applied Geology] Semester IV Examination	Students who have been admitted to this course in semester IV.
E	M. Sc. (Tech) Applied Geology] Semester V Examination	Students who have been admitted to this course in semester V.
F	M. Sc. (Tech) Applied Geology] Semester VI Examination	Students who have been admitted to this course in semester VI.

(Note: Subject to the Rules of ATKT as mentioned in para 9 of this direction)

9) A) The ATKT rules for admission for the M. Sc. Course (Theory, Practical and Seminar as separate passing head and on calculation fraction, if any, shall be ignored. Ex. If two third of the passing heads value is 3.01 or 3.75 or 3. 89 then it shall be considered as 3) shall be as given in the following table

Admission to Semester	Candidate should have passed in all the subjects of the following examination of R.T.M. Nagpur University	Candidate should have passed at least two third of the passing heads of the following examinations
Semester I	As provided in the para 6 of the direction	--------
Semester II	--------	--------
Semester III	--------	Semester I and II taken together
Semester IV	--------	--------

B) The ATKT rules for admission for the M. Sc. (Tech) Applied Geology Course (Theory, Practical and Seminar as separate passing head and on calculation fraction, if any, shall be ignored. Ex. If two third of the passing heads value is 3.01 or 3.75 or 3. 89 then it shall be considered as 3) shall be as given in the following table-

Admission to Semester	Candidate should have passed in all the subjects of the following examination of R.T.M. Nagpur University	Candidate should have passed at least two third of the passing heads of the following examinations
Semester I	As provided in the para 6 of the direction	--------
Semester II	--------	--------
Semester III	--------	Semester I and II taken together
Semester IV	--------	-------
Semester V	Semester I and II	a) Passed Semester I and II examination And b) Two third of the passing heads of Semester III and IV taken together
Semester VI	--------	-------

10) Without prejudice to other provisions of Ordinance no. 6 relating to the examination in general, provisions of Para 5, 8, 9, 10, 26, 31 and 32 of the said ordinance shall apply to every student admitted to this course.
11) The fees for the tuition, examination, laboratory and other fees shall be as prescribed by the university from time to time.
12) (a) The scope of the subjects shall be as prescribed in the syllabus.
    (b) The medium of instruction and examination shall be English.
13) The number of papers and maximum marks assigned to each paper and minimum marks / grade, an examinee must obtain in order to pass the examination shall be as prescribed in appendices appended with this direction.
14) The examinee at each of the examination shall have option of not being declared successful at the examination in case he / she does not secure a minimum of grade equivalent to 55% marks at the examination. This option will have to be exercised every time the application is submitted to any of the examinations. Once this option is exercised, the option shall be binding on the examinee and it shall not be evoked in under any circumstances.
15) The classification of the examinee successful at the semester and examinations and at the end of final semester examination shall be as per the rules and regulations of Choice Based Credit System as prescribed in appendices, appended with this direction.
16) The provisions of direction no. 3 of 2007 for the award of grace marks for passing an examination, securing higher grade in subject(s) as updated from time to time shall apply to the examination under this direction.
17) The names of the successful examinee passing the examination as a whole in the minimum prescribed period and securing the grades equivalent to first and second division shall be arranged in order of merit as provided in ordinance 6 relating to examination in general.
18) Successful examinees at the end of M. Sc. Sem-IV Examination (Sem VI for M. Sc. (Tech) Applied Geology) who obtained CGPA above 7.51 shall be placed in First Division with distinction, those obtaining CGPA from 6.00 to 7.50 shall be placed in First Division, those obtaining CGPA from 4.50 to 5.99 shall be placed in Second Division and those obtaining CGPA from 4.00 to 4.49 shall be placed in Third Division.
19) No candidate shall be admitted to an examination under this direction, if he / she has already passed the same examination of this university or of any other university.
20) Successful examinees at the M. Sc. Sem I, II, III, & IV ((Sem I, II, III, IV, V & VI for M. Sc. (Tech) Applied Geology) Examinations shall be entitled to receive a Certificate signed by the Controller of Examination of University (COE) and successful examinees at the end of M. Sc. Sem IV (Sem VI for M. Sc. (Tech) Applied Geology) examination shall, on payment of prescribed fees, receive a Degree in the prescribed format, signed by the Vice-Chancellor.
21) This course is based on Choice Based Credit System and therefore, it will be also regulated by guidelines and regulation given in appendices / annexure which are part of this direction.
22) Absorption scheme for failure students of the credit based semester pattern:
    a) While switching over to Choice Based Credit System, the failure students of credit based semester pattern will be given **Five** chances to clear the examination.
    b) The candidates who have cleared first and second semester of Part I of the Credit Based Semester Pattern examination in the concerned subject shall get admission to Third Semester of Part II of the Choice Based Credit System directly. However, candidates who are allowed to keep term will not be eligible for admission to Third Semester of Part II of the Choice Based Credit System unless they clear all the papers and practical of first and second semester of Part I of the Credit Based Semester Pattern examination.
        i. When the given five chances are exhausted, the candidates who are allowed to keep term shall be governed by "Equivalence of Syllabus showed between CBS & CBCS syllabus for desirous students". Such candidates can switch over to CBCS pattern. However, for such switching over, they have to clear equivalent papers as shown in the annexure 13 of concerned subject to get admission to Third Semester of Part II of the Choice Based Credit System.
    c) The candidates who have cleared Third and Fourth semester of Part II of the Credit Based Semester Pattern examination in the concerned subject shall get admission to Fifth Semester of Part III of the Choice Based Credit System directly. However, candidates who are allowed to keep term will not be eligible for admission to Fifth Semester of Part III of

the Choice Based Credit System unless they clear all the papers and practical of Third and Fourth semester of Part II of the Credit Based Semester Pattern examination.

i. When the given five chances are exhausted, the candidates who are allowed to keep term shall be governed by "Equivalence of Syllabus showed between CBS & CBCS syllabus for desirous students". Such candidates can switch over to CBCS pattern. However, for such switching over, they have to clear equivalent papers as shown in the annexure 13 of concerned subject to get admission to Fifth Semester of Part III of the Choice Based Credit System.

d) The candidates who have not cleared third or fourth semester of Part II of the Credit Based Semester Pattern examination in the concerned subject shall be governed by "Equivalence of Syllabus showed between CBS & CBCS syllabus for desirous students". Such candidates can switch over to CBCS pattern. However, for such switching over, they have to clear equivalent papers as shown in the annexure 13 of concerned subject to get Degree of M. Sc. under the Choice Based Credit System.

e) The candidates who have not cleared fifth or sixth semester of Part III of the Credit Based Semester Pattern examination in the concerned subject shall be governed by "Equivalence of Syllabus showed between CBS & CBCS syllabus for desirous students". Such candidates can switch over to CBCS pattern. However, for such switching over, they have to clear equivalent papers as shown in the annexure 13 of concerned subject to get Degree of M. Sc. under the Choice Based Credit System.

23) The absorption scheme mentioned in this direction shall be implemented from Summer 2018 examination. The Foundation Course / Core Subject Centric papers and Project shall be implemented from academic session 2018-19. The remaining part of syllabi shall be implemented in phasewise manner. i.e. Semester I and II syllabi from academic session 2018- 19 and Semester III & IV syllabi from academic session 2019-20 and so on.

24) With the issuance of this Direction, The Direction No 54 of 2016 (Choice Based Credit System) shall stand repealed.

Date 1/3/2018

Sd/-
Dr. S.P. Kane
Vice -Chancellor

Appendix-1

Scheme of teaching and examination under semester pattern Choice Based Credit System (CBCS) for M.Sc. Program in all subjects except Mathematics and M.Sc. (Tech) Applied Geology

Semester I for M.Sc. Program in all subjects except Mathematics and M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 1	Paper 1	4	-	4	4	3	80	20	100	40	
Core 2	Paper 2	4	-	4	4	3	80	20	100	40	
Core 3	Paper 3	4	-	4	4	3	80	20	100	40	
Core 4	Paper 4	4	-	4	4	3	80	20	100	40	
Pract. Core 1 & 2	Practical 1	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 3 & 4	Practical 2	-	8	8	4	3-8*	100**	-	100		40
Seminar 1	Seminar 1	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester II for M.Sc. Program in all subjects except Mathematics and M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 5	Paper 5	4	-	4	4	3	80	20	100	40	
Core 6	Paper 6	4	-	4	4	3	80	20	100	40	
Core 7	Paper 7	4	-	4	4	3	80	20	100	40	
Core 8	Paper 8	4	-	4	4	3	80	20	100	40	
Pract. Core 5 & 6	Practical 3	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 7 & 8	Practical 4	-	8	8	4	3-8*	100**	-	100		40
Seminar 2	Seminar 2	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester III for M.Sc. Program in all subjects except Mathematics and M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 9	Paper 9	4	-	4	4	3	80	20	100	40	
Core 10	Paper 10	4	-	4	4	3	80	20	100	40	
Core Elective 1	Paper 11	4	-	4	4	3	80	20	100	40	
Foundation Course 1 / **Core (Subject Centric) 1**	Paper 12	4	-	4	4	3	80	20	100	40	
Pract. Core 9 & 10	Practical 5	-	8	8	4	3-8*	100**	-	100		40
Pract. Core Elective 1	Practical 6	-	8	8	4	3-8*	100**	-	100		40
Seminar 3	Seminar 3	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester IV for M.Sc. Program in all subjects except Mathematics and M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 11	Paper 13	4	-	4	4	3	80	20	100	40	
Core 12	Paper 14	4	-	4	4	3	80	20	100	40	
Core Elective 2	Paper 15	4	-	4	4	3	80	20	100	40	
Foundation Course 2 / **Core (Subject Centric) 2**	Paper 16	4	-	4	4	3	80	20	100	40	
Pract. Core 11, 12 & Elective 2	Practical 7	-	8	8	4	3-8*	100**	-	100		40
Project	Project		8	8	4		100**	-	100		40
Seminar 4	Seminar 4	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Note: Th = Theory; Pr = Practical/lab, * = If required, for two days.
** = The Practical and Project shall be evaluated by both the External and Internal Examiner in the respective Department / Center / Affiliated College as per guidelines appended with this direction.

1. In each semester, the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field / subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion. The seminar will be open to all the teachers of the department, invitees, and students.
2. The student will have to carry out the project work (based on guidelines appended to this direction) in lieu of practical in the fourth semester in the department or depending on the availability of placement; he / she will be attached to any of the national / regional / private research institute / organization.
3. Internal Assessment Marks will be as per appendix attached in this direction.
4. **Foundation Course / Core (Subject Centric): for Details, refer Appendix 9.**
5. One credit of 25 marks for theory / tutorial will be of one clock hour per week, running for 15 weeks.
6. One credit of 25 marks for practical / project / seminar will be of two clock hour per week, running for 15 weeks.

Appendix-2

Scheme of teaching and examination under semester pattern Choice Based Credit System (CBCS) for M.Sc. Program in Mathematics

Semester I for M.Sc. Program in Mathematics												
Code	Theory / Practical	Teaching scheme (Hours / Week)		Credits			Examination Scheme					
							Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Total	Theory	Int. Assessment	Total		External Marks	Internal Ass		Th. External	Internal Ass.
Core 1	Paper 1	5	5	4	1	5	3	100	25	125	50	
Core 2	Paper 2	5	5	4	1	5	3	100	25	125	50	
Core 3	Paper 3	5	5	4	1	5	3	100	25	125	50	
Core 4	Paper 4	5	5	4	1	5	3	100	25	125	50	
Core 5	Paper 5	5	5	4	1	5	3	100	25	125	50	
	TOTAL	**25**	**25**	**20**	**5**	**25**		**500**	**125**	**625**	**250**	

Semester II for M.Sc. Program in Mathematics												
Code	Theory / Practical	Teaching scheme (Hours / Week)		Credits			Examination Scheme					
							Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Total	Theory	Int. Assessment	Total		External Marks	Internal Ass		Th. External	Internal Ass.
Core 6	Paper 6	5	5	4	1	5	3	100	25	125	50	
Core 7	Paper 7	5	5	4	1	5	3	100	25	125	50	
Core 8	Paper 8	5	5	4	1	5	3	100	25	125	50	
Core 9	Paper 9	5	5	4	1	5	3	100	25	125	50	
Core 10	Paper 10	5	5	4	1	5	3	100	25	125	50	
	TOTAL	**25**	**25**	**20**	**5**	**25**		**500**	**125**	**625**	**250**	

Semester III for M.Sc. Program in Mathematics												
Code	Theory / Practical	Teaching scheme (Hours / Week)		Credits			Examination Scheme					
								Max. Marks			Minimum Passing Marks	
		Th	Total	Theory	Int. Assessment	Total	Duration in hrs.	External Marks	Internal Ass	Total Marks	Th. External	Internal Ass.
Core 11	Paper 11	5	5	4	1	5	3	100	25	125	50	
Core 12	Paper 12	5	5	4	1	5	3	100	25	125	50	
Core 13	Paper 13	5	5	4	1	5	3	100	25	125	50	
Core Elective 1	Paper 14	5	5	4	1	5	3	100	25	125	50	
Foundation Course 1 / **Core (Subject Centric) 1**	Paper 15	5	5	4	1	5	3	100	25	125	50	
	TOTAL	**25**	**25**	**20**	**5**	**25**		**500**	**125**	**625**	**250**	

Semester IV for M.Sc. Program in Mathematics												
Code	Theory / Practical	Teaching scheme (Hours / Week)		Credits			Examination Scheme					
								Max. Marks			Minimum Passing Marks	
		Th	Total	Theory	Int. Assessment	Total	Duration in hrs.	External Marks	Internal Ass	Total Marks	Th. External	Internal Ass.
Core 14	Paper 16	5	5	4	1	5	3	100	25	125	50	
Core 15	Paper 17	5	5	4	1	5	3	100	25	125	50	
Core 16	Paper 18	5	5	4	1	5	3	100	25	125	50	
Core Elective 2	Paper 19	5	5	4	1	5	3	100	25	125	50	
Foundation Course 2 / **Core (Subject Centric) 2**	Paper 20	5	5	4	1	5	3	100	25	125	50	
	TOTAL	**25**	**25**	**20**	**5**	**25**		**500**	**125**	**625**	**250**	

*Internal Assessment: For the purpose of internal assessment the department will conduct three tests (with equal weight of marks). Best two scores of a student in these tests will be considered to obtain the internal assessment score of that student.

Foundation Course / Core (Subject Centric): for Details, refer Appendix 9.

Appendix-3

Scheme of teaching and examination under semester pattern Choice Based Credit System (CBCS) for M.Sc. (Tech) Applied Geology

Semester I for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 1	Paper 1	4	-	4	4	3	80	20	100	40	
Core 2	Paper 2	4	-	4	4	3	80	20	100	40	
Core 3	Paper 3	4	-	4	4	3	80	20	100	40	
Core 4	Paper 4	4	-	4	4	3	80	20	100	40	
Pract. Core 1 & 2	Practical 1	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 3 & 4	Practical 2	-	8	8	4	3-8*	100**	-	100		40
Seminar 1	Seminar 1	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester II for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 5	Paper 5	4	-	4	4	3	80	20	100	40	
Core 6	Paper 6	4	-	4	4	3	80	20	100	40	
Core 7	Paper 7	4	-	4	4	3	80	20	100	40	
Core 8	Paper 8	4	-	4	4	3	80	20	100	40	
Pract. Core 5 & 6	Practical 3	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 7 & 8	Practical 4	-	8	8	4	3-8*	100**	-	100		40
Seminar 2	Seminar 2	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester III for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 9	Paper 9	4	-	4	4	3	80	20	100	40	
Core 10	Paper 10	4	-	4	4	3	80	20	100	40	
Core 11	Paper 11	4	-	4	4	3	80	20	100	40	
Core 12	Paper 12	4	-	4	4	3	80	20	100	40	
Pract. Core 9 & 10	Practical 5	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 11 & 12	Practical 6	-	8	8	4	3-8*	100**	-	100		40
Seminar 3	Seminar 3	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester IV for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 13	Paper 13	4	-	4	4	3	80	20	100	40	
Core 14	Paper 14	4	-	4	4	3	80	20	100	40	
Core 15	Paper 15	4	-	4	4	3	80	20	100	40	
Core 16	Paper 16	4	-	4	4	3	80	20	100	40	
Pract. Core 13 & 14	Practical 7	-	8	8	4	3-8*	100**	-	100		40
Pract. Core 15 & 16	Practical 8	-	8	8	4	3-8*	100**	-	100		40
Seminar 4	Seminar 4	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester V for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Houurs / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 17	Paper 17	4	-	4	4	3	80	20	100	40	
Core 18	Paper 18	4	-	4	4	3	80	20	100	40	
Core Elective 1	Paper 19	4	-	4	4	3	80	20	100	40	
Foundation Course 1 / **Core (Subject Centric) 1**	Paper 20	4	-	4	4	3	80	20	100	40	
Pract. Core 17 & 18	Practical 9	-	8	8	4	3-8*	100**	-	100		40
Pract. Core Elective 1	Practical 10	-	8	8	4	3-8*	100**	-	100		40
Seminar 5	Seminar 5	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Semester VI for M.Sc. Program in M.Sc. (Tech) Applied Geology											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Core 19	Paper 21	4	-	4	4	3	80	20	100	40	
Core 20	Paper 22	4	-	4	4	3	80	20	100	40	
Core Elective 2	Paper 23	4	-	4	4	3	80	20	100	40	
Foundation Course 2 / **Core (Subject Centric) 2**	Paper 24	4	-	4	4	3	80	20	100	40	
Pract. Core 19, 20	Practical 11	-	8	8	4	3-8*	100**	-	100		40
Pract. Core Elective 2	Practical 12	-	8	8	4	3-8*	100**	-	100		40
Seminar 6	Seminar 6	2	-	2	1			25	25	10	
	TOTAL	**18**	**16**	**34**	**25**		**520**	**105**	**625**	**170**	**80**

Note: Th = Theory; Pr = Practical/lab, * = If required, for two days.
** = The Practical shall be evaluated by both the External and Internal Examiner in the respective Department / Center / Affiliated College as per guidelines appended with this direction.

1. In each semester, the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field / subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion. The seminar will be open to all the teachers of the department, invitees, and students.
2. Internal Assessment Marks will be as per appendix attached in this direction.
3. **Foundation Course / Core (Subject Centric): for Details, refer Appendix 9.**
4. One credit of 25 marks for theory / tutorial will be of one clock hour per week, running for 15 weeks.
5. One credit of 25 marks for practical / project / seminar will be of two clock hour per week, running for 15 weeks.

Appendix-4

Project Work Scheme / Guidelines for the Students, Supervisors and Examiners

Every student is required to carry out a project work in semester IV. The project can be of following types. A) Experimental Project Work; OR B) Field Based Project Work; OR C) Review writing based Project Work.

Experimental Project Work OR Field Based Project Work:

Student can carry out Experimental / Field based Project Work on a related research topic of the subject /course. It must be an original work and must indicate some degree of experimental work / Field work. On the basis of this work, student must submit the Project Report (typed and properly bound) in two copies at least one month prior to commencement of the final Practical / lab Examination of Semester IV or VI as applicable. The project report shall comprise of Introduction, Material and Methods, Results, Discussion, Summary, Conclusion and References along with the declaration by the candidate that the work is original and not submitted to any University or Organization for award of the degree and certificate by the supervisor and forwarded through Head / Course-coordinator / Director of the Department / Centre or the Principal of the College.

Review writing based Project Work.

Student can carry out review writing based Project Work on a related topic of the subject / course. It must be a review of topic based on research publications. Student shall refer peer reviewed original research publications and based on findings, write a summary of the same. The pattern of review writing shall be based on reputed reviews published in a standard, peer reviewed journals. On the basis of this work, student must submit the Project Report (typed and properly bound) in two copies at least one month prior to commencement of the final Practical / lab Examination of Semester IV or VI as applicable. The project report shall comprise of Abstract, Introduction, detailed review, Discussion, Summary, Conclusion and References along with the declaration by the candidate that the work is original and not submitted to any University or Organization for award of the degree and certificate by the supervisor and forwarded through Head / Course-coordinator / Director of the Department / Centre or the Principal of the College.

The supervisor shall be able to guide not more than 11 (Eleven) students in the given examination. The supervisor shall declare in the project of every student which he / she guiding stating that he / she has not guided more than 11 students in the given examination.

The supervisors for the Project Work shall be from the following.

A person shall be full time university PG recognized faculty member in the relevant subject.

OR

A person shall be full time university UG recognized faculty member in the relevant subject having Ph. D. and teaching the relevant subject for 5 years OR not having Ph. D. and teaching the relevant subject for 10 years.

OR

A person shall be full time university approved faculty member in related subject having Ph. D. with 5 years teaching experience or OR not having Ph. D. but having 10 years teaching experience and teaching the relevant subject.

OR

Scientists of National Laboratories / Regional Research Laboratories who are approved by virtue of their appointments in such facilities by the Union Government / the State Government / Nagpur University / Other Universities recognized by UGC.

OR

A person appointed in PG on contractual / contributory basis, having NET / SET and approved by the University in the relevant subject and having 3 years teaching experience as contractual / contributory at PG level.

OR

University approved Ex-Faculty members in the relevant subject

The Project Work will carry total 100 marks and will be evaluated by both external and internal examiner in the respective Department / Center / Affiliated College.

The examiners will evaluate the Experimental Project Work taking into account the Coverage of subject matter, Arrangement and presentation, References, etc.

For written Project work	: 40 Marks – Evaluated jointly by External & Internal
Presentation	: 20 Marks – Evaluated jointly by External & Internal
For Viva-Voce	: 20 Marks – Evaluated by External examiner
Internal Assessment	: 20 Marks – Evaluated by Internal examiner
	----------
Total	: 100 Marks

Appendix-5

Seminar

Guidelines for Students, Supervisors and Examiners

In each semester (Except M. Sc. Mathematics), the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field / subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion. The seminar will be open to all the teachers of the department, invitees, and students.

The students should submit the seminar report typed and properly bound in two copies to the Head of the Department. The said shall be evaluated by the concerned Supervisor / Head of the Department. The marks of the seminar shall be forwarded to the university within due period through Head of the Department. The record of the seminar should be preserved till the declaration of the final result.

Appendix 6

Internal Assessment:

1. The internal assessment marks shall be awarded by the concerned teacher.
2. The internal assessment shall be completed by the College / University at least 15 days prior to the final examination of each semester. The Marks shall be sent to the University immediately after the Assessment in the prescribed format.
3. For the purpose of internal assessment the University Department / College shall conduct one to three assignments described below. Best two scores of a student in these assignments shall be considered to obtain the internal assessment score of that student.
4. General guidelines for Internal Assessment are:
   a) The internal assessment marks assigned to each theory paper as mentioned in Appendix 1 shall be awarded on the basis of attendance and assignments like class test, home assignments, study tour, industrial visits, visit to educational institutions and research organizations, field work, group discussions or any other innovative practice / activity.
   b) There shall be one to three assignments (as described above) per Theory paper.
   c) There shall be no separate / extra allotment of work load to the teacher concerned. He/ She shall conduct the Internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.
   d) The concerned teacher / Department / College shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.
   e) At the beginning of each semester, every teacher / Department / College shall inform his / her students unambiguously the method he / she propose to adopt and the scheme of marking for internal assessment.
   f) Teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD / Principal.
   g) Final submission of internal marks to the University shall be before the commencement of the University Theory / Practical examinations.

Appendix 7

Practical Examination

1. Each practical carries 100 marks. For the examination, the distribution of the marks shall be as follows:
    a. Record / Journal / Internal assessment : 20 marks – Evaluated by Internal
    b. Practical Performance : 60 marks – Evaluated jointly by External & Internal
    c. Viva-voce : 20 marks - Evaluated by External

    NOTE: Practical performance shall be jointly evaluated by the External and Internal Examiner. In case of discrepancy, the External Examiner's decision shall be final.
2. Practical exam shall be of 3 to 8 hours duration for one or two days, depending on subject and number of students.
3. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department.
4. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.
5. The certificate template shall be as follows:

C E R T I F I C A T E

Name of the college / institution _

Name of the Department: _

This is to certify that this Practical Record contains the bonafide record of the Practical work of Shri / Shrimati / Kumari _ of M. Sc. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ Semester _ _ _ _ _ _ _ _ _ during the academic year _ _ _ _ _ _ _. The candidate has satisfactorily completed the experiments prescribed by Rashtrasant Tukdoji Maharaj Nagpur University for the subject _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Dated _ _ _ / _ _ _ / _ _ _ _ _

Signature of the teacher who taught the examinee

1. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

2. _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Head of the Department

Appendix 8

Subject wise Core Elective Papers:

M. Sc. Subject	Core elective paper to be opted in sem III (Sem V in case of M. Sc. (Tech) Applied Geology)	Core elective paper to be opted in sem IV (Sem VI in case of M. Sc. (Tech) Applied Geology)
M. Sc. (Physics)	Materials Science I	Materials Science II
	X-ray I	X-ray II
	Nanoscience & Nanotechnology I	Nanoscience & Nanotechnology II
	Atomic and Molecular Physics I	Atomic and Molecular Physics II
	Applied Electronics I	Applied Electronics II
M. Sc. (Chemistry)	Nuclear Chemistry I	Nuclear Chemistry II
	Environmental Chemistry I	Environmental Chemistry II
	Polymer Chemistry I	Polymer Chemistry II
	Medicinal Chemistry I	Medicinal Chemistry II
M. Sc. (Mathematics)	Fluid Dynamics-I	Fluid Dynamics-II
	General Relativity	Cosmology
	Algebraic Topology- I	Algebraic Topology- II
	Non-Linear Programming-I	Non-Linear Programming-II
	Operator Theory	Advance Algebra
M. Sc. (Statistics)	Mathematical Programming	Operations Research
	Survival Analysis	Reliability Theory
	Bioassay	Statistical Genetics
	Demography	Statistical Ecology
	Time Series Analysis	Stochastic Models In Finance
M. Sc. (Computer Science)	Neural Network	Design and Analysis of Algorithm
	Multimedia Technologies	Embedded System
	ASP.NET	Pattern Recognition
M. Sc. (Information Technology)	Soft Computing	Design and Analysis of Algorithm
	Distributed Databases	Cloud Computing
	Object Oriented Analysis and Design using UML	Mobile Computing
M. Sc. (Electronics)	Digital signal Processing	Microwave and Optical Communication
	Digital Image Processing	Computer Communication
M. Sc. (Botany)	Molecular Biology and Plant Biotechnology I	Molecular Biology and Plant Biotechnology II
	Mycology and Plant Pathology I	Mycology and Plant Pathology II
	Reproductive Biology of Angiosperms- I	Reproductive Biology of Angiosperms- II
	Plant Physiology I	Plant Physiology II
	Palynology - I	Palynology - II
M. Sc. (Zoology)	Entomology II	Entomology IV
	Fish & Fisheries II	Fish & Fisheries IV
	Mammalian Reproductive Physiology (MRP) II	Mammalian Reproductive Physiology (MRP) IV
	Animal Physiology II	Animal Physiology IV
	Environmental Biology II	Environmental Biology IV
M. Sc. (Microbiology)	Microbial Diversity, Evolution and Ecology (MDEE) I	Microbial Diversity, Evolution and Ecology (MDEE) II
	Bioinformatics (BIF) I	Bioinformatics (BIF) II

M. Sc. (Biochemistry)	Biochemical & Environmental Toxicology	Clinical Research
	Nutritional Biochemistry	Applied Nutritional Biochemistry
M. Sc. (Biotechnology)	Industrial Biotechnology I	Industrial Biotechnology II
	Environmental Biotechnology I	Environmental Biotechnology II
M. Sc. (Environmental Science)	Water & Water Treatment	Environmental Impact assessment and Legislation
	Water supply and resources	Environmental Management
M. Sc. (Molecular Biology and Genetic Engineering)	Molecular Diagnostics Methods	Molecular Diagnostics
	Plant Genetic Engineering I	Plant Genetic Engineering II
	Bioinformatics I	Bioinformatics II
M. Sc. (Geology)	Mining Geology & Mineral Exploration	Exploration Geochemistry
	Applied & Industrial Micropaleontology	Quaternary Geology & Limnogeology
	Petroleum Exploration	Basin Analysis & Sequence Stratigraphy
		Marine Geology & Oceanography
M. Sc. (Tech) Applied Geology	Exploration Geochemistry	Petroleum Exploration
	Quaternary Geology & Limnogeology	Basin Analysis & Sequence Stratigraphy
		Marine Geology & Oceanography
M. Sc. (Medicinal Plants)	Natural Plant Products and Phytochemistry - I	Natural Plant Products and Phytochemistry – I
	Forensic & Industrial Botany I	Forensic & Industrial Botany – II

Appendix 9

Foundation Course / Core (Subject Centric): Student can choose either Foundation course paper or Core (Subject Centric) paper. Once the choice between Foundation Course / Core (Subject Centric) is made by the candidate, it can not be changed in Semester IV.

Part A:

Foundation Course:

1. Candidate can opt for any one foundation course paper as shown below in the semester III and IV (Semester V & VI in case of M. Sc. (Tech) Applied Geology). However, Student shall opt for this paper from any subject other than his / her main subject for postgraduation (Eg. A candidate pursuing M. Sc. Mathematics can opt for foundation course papers mentioned in other M. Sc. Subjects except papers mentioned under M. Sc. Mathematics). The exception to the above condition in some subjects is mentioned in the table below. If the candidate decides to opt for foundation course papers then he/she shall not be eligible to opt for Core (Subject Centric) papers in their respective subjects.
2. Once the candidate chooses foundation course paper of any one subject, then he / she can not change the subject in semester IV. (Eg. If a M. Sc. Biochemistry candidate has chosen foundation course paper from M. Sc. Mathematics, then he has to pursue the foundation course paper of M. Sc. Mathematics in Semester IV also).
3. Intake capacity for the foundation courses is listed in the table. However, in no case, the intake capacity shall be above the sanctioned capacity for the said course. This is applicable to affiliated colleges also. The intake capacity at the affiliated colleges shall be displayed by the respective college.
4. The affiliated colleges where there is only one postgraduate subject can allow the candidates to choose foundation courses in other subjects for which the affiliated college have undergraduate department / subjects. However, they have to fulfill the condition of eligible teachers as mentioned below.
5. Every year, the University shall add or delete (as the case may be) and prepare fresh list of foundation course available in all faculties for the candidates admitted in semester I of the respective year. The list along with syllabi shall be displayed on the University website for the benefit of candidates.
6. The admission process shall begin and be completed within 30 days from the declaration of result of Semester I. The admission to foundation course shall be based on merit list prepared (if required) on the basis of marks obtained by the candidate at the graduation level.
7. Once the candidate opts for foundation course in any subject, there shall be no change allowed.
8. The following faculty will be considered eligible to teach, set papers, internal assessment, valuation, etc of the foundation courses in the subject.
    a. A person shall be full time university PG recognized faculty member in the relevant subject.
    OR
    b. A person shall be full time university UG recognized faculty member in the relevant subject.
    OR
    c. A person shall be full time university approved faculty member in related subject and teaching the relevant subject at UG / PG level on contract / contributory / guest faculty for 5 years.
    OR
    d. A person appointed in PG on contractual / contributory basis, having NET / SET and approved by the University in the relevant subject and having 5 years teaching experience as contractual / contributory at PG level.
    OR
    e. University approved Ex-Faculty members in the relevant subject
9. The teaching process of the foundation courses shall be arranged in a manner that it shall not affect the teaching – learning process of the parent course.

List of Foundation Subjects for Post Graduate Courses:

S. No.	Subject	Board	4th Papers of Semester-IIIi.e. 3T4 (Name of the Paper)	4th Papers of Semester-IVi.e 4T4 (Name of the Paper)	Intake capacity at the University departments
1	Mathematics	Mathematics	Mathematics-I (Elementary Mathematics)	Mathematics-II (Elementary Discrete Mathematics)	60
2	Physics	Physics	Physics-I (Classical Physics)	Physics-II (Modern Physics)	45
3	Chemistry	Chemistry	Chemistry-I (Applied Analytical Chemistry I)	Chemistry-II (Applied Analytical Chemistry II)	45
4	Bio-Technology (Ad-hoc)	Bio-Technology	Bio-Technology-I (Introductory Biotechnology)	Bio-Technology-II (Molecular Biotechnology)	10
5	Computer Science	Computer Science and Engineering	Computer Science-I (Operating System Concepts)	Computer Science-II (Advances in Information Technology)	20
6	Environmental Science	Environmental Science	Environmental Science-I (Fundamentals of Environmental Science I)	Environmental Science-II (Fundamentals of Environmental Science II)	20
7	Botany	Botany	Botany-I (General Botany)	Botany-II (Applied Botany)	37
8	Zoology	Zoology	Zoology-I (Basic Entomology)	Zoology-II (Applied & Industrial Entomology)	37
9	Statistics	Statistics	Statistics-I (Mathematical Statistics)	Statistics-II (Applied Statistics)	25
10	Business Management	Business Management	Business Management -I (_ _ _ _ _ _ _)	Business Management -II (_ _ _ _ _ _ _)	
11	Accountancy	Account & Statistics	Account & Statistics-I (_ _ _ _ _ _ _)	Account & Statistics-II (_ _ _ _ _ _ _)	
12	Managerial Skill	Commerce	Managerial Skills-I (_ _ _ _ _ _ _)	Managerial Skills-II (_ _ _ _ _ _ _)	
13	Education Technology & Management Skills	Education and Commerce	Education Technology & Management Skills-I	Education Technology & Management Skills-II	

S. No.	Subject	Board	4th Papers of Semester-IIIi.e. 3T4 (Name of the Paper)	4th Papers of Semester-IVi.e 4T4 (Name of the Paper)	Intake capacity at the University departments
			(_ _ _ _ _ _ _)	(_ _ _ _ _ _ _)	
14	Communication Skill	English	Communication Skills-I (_ _ _ _ _ _ _)	Communication Skills-II (_ _ _ _ _ _ _)	
15	Sanskrit	Sanskrit	Sanskrit-I (_ _ _ _ _ _ _)	Sanskrit-II (_ _ _ _ _ _ _)	
16	German	Other Foreign Languages	German-I (_ _ _ _ _ _ _)	German-II (_ _ _ _ _ _ _)	
17	French	Other Foreign Languages	French-I (_ _ _ _ _ _ _)	French-II (_ _ _ _ _ _ _)	
18	Law	Law	Law-I (_ _ _ _ _ _ _)	Law-II (_ _ _ _ _ _ _)	
19	Pharmaceutical Sciences	Pharmaceutical Sciences	Pharmaceutical Sciences-I (_ _ _ _ _ _ _)	Pharmaceutical Sciences-II (_ _ _ _ _ _ _)	
20	Life skills	Education	Life Skills-I (_ _ _ _ _ _ _)	Life Skills-II (_ _ _ _ _ _ _)	
21	Economics	Economics	Economics-I (_ _ _ _ _ _ _)	Economics-II (_ _ _ _ _ _ _)	
22	Political Science	Political Science	Political Science-I (_ _ _ _ _ _ _)	Political Science-II (_ _ _ _ _ _ _)	
23	Sociology	Sociology	Sociology-1 (_ _ _ _ _ _ _)	Sociology-II (_ _ _ _ _ _ _)	
24	Psychology	Psychology	Psychology-I (_ _ _ _ _ _ _)	Psychology-II (_ _ _ _ _ _ _)	
25	Philosophy	Philosophy	Philosophy-I (_ _ _ _ _ _ _)	Philosophy-II (_ _ _ _ _ _ _)	
26	History	History	History-I (_ _ _ _ _ _ _)	History-II (_ _ _ _ _ _ _)	
27	Public Administration	Public Administration	Public Admn -I (_ _ _ _ _ _ _)	Public Admn -II (_ _ _ _ _ _ _)	
28	Buddhist Studies	Buddhist Studies	Buddhist Studies-I (_ _ _ _ _ _ _)	Buddhist Studies-II (_ _ _ _ _ _ _)	
29	Gandhian Thoughts	Gandhian Thoughts	Gandhian Thoughts-I (_ _ _ _ _ _ _)	Gandhian Thoughts-II (_ _ _ _ _ _ _)	
30	Dr. Ambedkar Thoughts	Dr. Ambedkar Thoughts	Dr. Ambedkar Thoughts - I	Dr. Ambedkar Thoughts - II	
31	Rashtrasant Tukdoji Maharaj Thoughts	Rashtrasant Tukadoji Maharaj Thoughts	Rashtrasant Tukdoji Maharaj Thoughts-I (_ _ _ _ _ _ _)	Rashtrasant Tukdoji Maharaj Thoughts-II (_ _ _ _ _ _ _)	

S. No.	Subject	Board	4th Papers of Semester-IIIi.e. 3T4 (Name of the Paper)	4th Papers of Semester-IVi.e 4T4 (Name of the Paper)	Intake capacity at the University departments
32	Travel & Tourism	Travel & Tourism	Travel & Tourism-I (_ _ _ _ _ _ _)	Travel & Tourism-II (_ _ _ _ _ _)	
33	Personality Development	Human Development	Personality Development-I (_ _ _ _ _ _)	Personality Development-II (_ _ _ _ _ _)	
34	Cosmetic Technology	Cosmetic Technology	Cosmetic Technology-I (_ _ _ _ _ _)	Cosmetic Technology-II (_ _ _ _ _ _)	
35	Hospitality Management	Hotel Management & Catering Technology	Hospitality Management -I (_ _ _ _ _ _)	Hospitality Management-II (_ _ _ _ _ _)	
36	Chemical Engineering	Chemical Engineering	Chemical Engineering-I (_ _ _ _ _ _ _)	Chemical Engineering-II (_ _ _ _ _ _)	
37	Chemical Technology	Chemical Technology	Chemical Technology-I (_ _ _ _ _ _)	Chemical Technology-II (_ _ _ _ _ _)	
38	Civil Engineering	Civil Engineering	Civil Engineering-I (_ _ _ _ _ _ _)	Civil Engineering-II (_ _ _ _ _ _ _)	
39	Electrical Engineering	Electrical Engineering	Electrical Engineering-I (_ _ _ _ _ _)	Electrical Engineering-II (_ _ _ _ _ _)	
40	Mechanical Engineering	Mechanical Engineering	Mechanical Engineering-I (_ _ _ _ _ _)	Mechanical Engineering-II (_ _ _ _ _ _)	
41	Electronics Engineering	Electronics Engineering	Electronics Engineering-I (_ _ _ _ _ _)	Electronics Engineering-II (_ _ _ _ _ _)	
42	Pali Prakrit	Pali Prakrit	Pali Prakrit-I (_ _ _ _ _ _)	Pali Prakrit-II (_ _ _ _ _ _)	

Part B:

Core (Subject Centric): Candidate can opt for this paper as shown below in the semester III and IV (Semester V & VI in case of M. Sc. (Tech) Applied Geology) in their main subject of postgraduation only (Ex. A candidate pursuing M. Sc. Mathematics can opt for Core (Subject Centric) papers from M. Sc. Mathematics ONLY). If the candidate decides to opt for Core (Subject Centric) papers in their main subject of postgraduation then he/she shall not be eligible to opt for foundation course papers neither in their own subject nor in any other subject).

List of Core (Subject Centric) course available in the respective subject:

M. Sc. Subject	**Core (Subject Centric) I in semester III (Sem V in case of M. Sc. (Tech) Applied Geology)**	**Core (Subject Centric) II in Semester IV (Sem VI in case of M. Sc. (Tech) Applied Geology)**
M. Sc. (Physics)	Nanoscience & Nanotechnology	Experimental Techniques in Physics
	Quantum Computing	Communication Electronics
	Digital Electronics & Microprocessor	Electroacoustics
M. Sc. (Chemistry)	Spectroscopy I	Spectroscopy II
M. Sc. (Mathematics)	Operation Research I	Operation Research II
M. Sc. (Statistics)	Industrial Process and Quality Control	Industrial Statistics
	Data Mining	Actuarial Statistics
M. Sc. (Computer Science)	Mobile Computing	Parallel Computing
M. Sc. (Information Technology)	CORBA	Enterprise Computing
M. Sc. (Electronics)	Mechatronics	Mobile and Satellite Communication
M. Sc. (Botany)	Aesthetic Botany	Plant Resources
M. Sc. (Zoology)	Wild Life & Avian Biology	Radiation & Chronobiology
M. Sc. (Microbiology)	Drugs & Disease Management (DDM)	Vaccines & Delivery Systems
M. Sc. (Biochemistry)	Bioresearch Techniques I	Bioresearch Techniques I
M. Sc. (Biotechnology)	Diagnostic Medical Biotechnology	Therapeutic Medical Biotechnology
M. Sc. (Environmental Science)	Advanced Water & Waste Water Treatment	Disaster Management
M. Sc. (Molecular Biology and Genetic Engineering)	Cytology & Genetics	Applied Genetics
M. Sc. (Geology)	Environmental Geology & Engineering Geology	Fuel Geology (Coal, Petroleum & Nuclear)
M. Sc. (Tech) Applied Geology	Environmental Geology & Geohazards	Geodesy & Mapping
M. Sc. (Medicinal Plants)	Cultivation & Utilization of Medicinal Plants	Cultivation & Utilization of Aromatic Plants

Appendix – 10

Coding pattern

In each case the following coding pattern shall be used to describe the theory/practical/seminar components of a subject/Paper:-

i) In the first Semester, the theory papers shall be coded as 1T1, 1T2, 1T3 and so on. Similarly, the practical, prescribed in the first Semester, shall be coded as 1P1, 1P2, 1P3 and so on, if practical is a component of the subject. Where, however, a subject has no practical as a component and consists of theory part only the practicals shall be commensurately codified, for e.g. the first subject/paper has got theory component only and no practical but the second subject/paper has got both theory as well as practical component then the second subject paper will have the following coding:

The theory component of the subject / paper will be coded as 1T2 and so on and practical component will be coded as 1P2 and so on. Therefore, in this case, there will not be coding of 1P1. So also where a subject/paper consists only of practical component and there is no theory component in such a case there will not be commensurate theory code. For example, if the third subject/paper of a course in a semester has no theory component and there is only practical component, in this case the practical will be coded as 1P3 but there will not be 1T3. Therefore, the 4^{th} subject/paper having the theory component only will be coded as 1T4, directly.

ii) Where there is a project, it shall be coded as PROJ. For ex. If fourth semester has project, it will be coded as 4PROJ1

iii) In the second and subsequent semesters the coding of subject shall be on the same principle on which coding is done for the first semester.

iv) Where seminars are prescribed in any course the same shall be coded on the principle on which theory and practical components are coded. For e.g. the seminars may be coded as 1S1, 2S1, if seminars are prescribed in 1^{st} and 2^{nd} semesters respectively.

Appendix-11

General Rules and Regulations regarding pattern of question paper, absorption scheme and choice based credit system:

A) Pattern of Question Paper

1. There will be four units in each paper.
2. Maximum marks of each theory paper will be 80 (In M. Sc. Mathematics, each paper will be of 100 marks)
3. Question paper will consist of five questions, each of 16 marks (In M. Sc. Mathematics, each question will be of 20).
4. Four questions will be on four units with internal choice (One question on each unit).
5. Fifth question will be compulsory with questions from each of the four units having equal weightage and there will be no internal choice.

B) Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

M. Sc. Program shall consist of four semesters, wherein the student has to complete 100 credits. Each subject (or course) has fixed number of credits. The types of subject subheads are: Core, Core Pract, Core (Subject Centric), Core Elective, Core Elective Pract, Foundation Course, Seminar and Project / Review writing.

Explanatory terms:

1. **Core:** Major theory papers in the concerned subject.
2. **Core Elective:** These papers will be specialization in the concerned subject. Ex. Zoology – MRP, AP, Fisheries, Entomology etc.
3. **Foundation Course / Core (Subject Centric):** For details, refer Appendix 9.
4. **Project / Review writing:** Project / Review writing is in semester IV (Semester VI in M.Sc. (Tech) Applied Geology, if applicable).
5. **Seminar:** The seminar in each semester shall be presented by the candidate in his / her parent department only.

Credits:

It is a unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work / field work per week.

For example a subject with 6-2-6 (L-T-P) means it has 6 Lectures, 2 Tutorial and 6 Practical in a week. This subject will have ten credits (6x1 + 2x½ + 6x½ = 10). If a student is declared pass in a subject, then he/she gets the credits associated with that subject. Depending on the marks scored in a subject, student is given a Grade. Each grade has got certain grade points as follows:

Letter Grade	O	A+	A	B+	B	C	P	F	Ab
Grade Point	10	09	08	07	06	05	04	0	0

A student obtaining Grade F shall be considered failed and will be required to reappear for the examination.

Valuation pattern:

Every credit is for 25 marks and valuation and grade points will be given as per following pattern.

Marks obtained in Theory / Practical of 100 marks	Marks obtained in Theory / Practical of 50 marks	Marks obtained in Theory / Practical of 25 marks	Letter Grade	Grade point
91-100	46-50	23-25	O	10
81-90	41-45	20-22	A+	09
71-80	36-40	18-19	A	08
61-70	31-35	15-17	B+	07
51-60	26-30	13-14	B	06
41-50	21-25	11-12	C	05
= 40	=20	=10	P	04
<40	<20	<10	F	0
Ab	Ab	Ab	Ab	0

Computation of SGPA and CGPA

Following is the procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

SGPA (Si) = Σ(Ci x Gi) / Σ Ci

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for SGPA

Code	Theory / Practical	Credits	Marks Obtained	Out of	Grade Point	Grade Letter	Credit Point (Credit x Grade Point)
Core 1	Paper 1	4	91	100	10	O	4x10=40
Core 2	Paper 2	4	89	100	9	A+	4x9=36
Core 3	Paper 3	4	50	100	5	C	4x5=20
Core 4	Paper 4	4	78	100	8	A	4x8=32
Pract. Core 1 & 1	Practical 1	4	89	100	9	A+	4x9=36
Pract. Core 3 & 4	Practical 2	4	85	100	9	A+	4x9=36
Seminar 1	Seminar 1	1	23	25	10	O	1x10=10
	Total	**25**					**210**
Thus, **SGPA =210/25 = 8.4**							

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

CGPA = Σ (Ci x Si) / Σ Ci

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

Illustration for CGPA

Semester 1	**Semester 2**	**Semester 3**	**Semester 4**
Credit : 25 SGPA: 8.46	Credit : 25 SGPA: 7.83	Credit : 25 SGPA: 5.69	Credit : 25 SGPA: 6.31

Thus,

$$\textbf{CGPA} = \frac{25 \times 8.46 + 25 \times 7.83 + 25 \times 5.69 + 25 \times 6.31}{100}$$

$$= \frac{211.5 + 195.75 + 142.45 + 157.75}{100} = \frac{707.25}{100} = \mathbf{7.0725} \qquad \textbf{i.e. 7.07}$$

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts. Ex. 7.0765 = 7.08 or 7.0755 = 7.07 or 6.5168 = 6.52 etc.

Transcript (Format): Based on the above recommendations on Letter grades, grade points and SGPA and CCPA, the HEIs may issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters.

Appendix 12
Workload Chart for M. Sc. Subjects in Faculty of Science & Technology

Note:

1. The M. Sc. Course is semester pattern comprising of total Four Semester Except M. Sc. Tech (Applied Geology) where it is of Six semesters
2. Sem I, III and V from June to Nov/Dec and Sem II, IV and VI from Dec/Jan to April
3. Each Theory or Practical or Tutorials or Seminar period is of One hour duration.
4. Ref. Column No 8 & 9 – the workload depends on Theory, Core Elective, Foundation Papers and Practical Batches, hence total workload can not be given.

S. No.	Name of the subject according to University Syllabi	Post Graduate Degree semester	Total no. of papers	Total Periods in a week				Total workload / Periods	Remarks
				Theory Periods	Practical Periods	Seminar (Equivalent to Theory periods)	Total workload in Hours		Science faculty according to Ordinance No. -----
1	2	3	4	5	6	7	8	9	10
1	Physics	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
2	Chemistry	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
3	Mathematics	Sem I	5	25	- -	- -	- -	- -	-No Practical-
		Sem III	5	25	- -	- -	- -	- -	
		Sem II	5	25	- -	- -	- -	- -	
		Sem IV	5	25	- -	- -	- -	- -	
4	Statistics	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
5	Computer Science	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
6	Information Technology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
7	Electronics	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
8	Botany	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	

9	Zoology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	

		Sem IV	4	16	16	2	- -	- -	for Practical
10	Microbiology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
11	Biochemistry	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
12	Biotechnology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
13	Environmental Science	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
14	Molecular Biology & Genetic Engineering	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
15	Geology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
16	Medicinal Plants	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
17	Applied Tech Geology	Sem I	4	16	16	2	- -	- -	A batch will not exceed by more than 11 students for Practical
		Sem III	4	16	16	2	- -	- -	
		Sem V	4	16	16	2	- -	- -	
		Sem II	4	16	16	2	- -	- -	
		Sem IV	4	16	16	2	- -	- -	
		Sem VI	4	16	16	2	- -	- -	

Appendix – 13

Equivalence of Syllabus showing between CBS & CBCS syllabus for desirous students

Such candidates of the CBS system have to clear equivalent papers as shown in the annexure of concerned subject (attached to this Appendix-13) to get admission in the Choice Based Credit System.

ANNEXURE M. Sc. (Tech) Applied Geology

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc (Tech) Semester I and II and in the year 2016-17, at M.Sc. (Tech) Semester –III and Semester IV and in the year 2017-18 at M. Sc. (Tech) Semester V and VI

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. (Tech) Applied Geology CBS Pattern : Semester -I							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Mineralogy and Crystallography (3+1)	100	4		I	1T1		Mineralogy and Crystallography (3+1)	80+ 20	4
02		Paper II	Igneous Petrology (4)	100	4		I	1T2		Igneous Petrology (4)	80+20	4
03		Paper III	Sedimentology (4)	100	4		I	1T3		Sedimentology (4)	80+20	4
04		Paper IV	Paleontology and Applied Paleobiology (3+1)	100	4		I	1T4		Paleontology and Applied Paleobiology (3+1)	80+20	4
05		Practical I	Mineralogy, Crystallography, and Igneous Petrology	80+ 20	4		I	1P1		Mineralogy, Crystallography, and Igneous Petrology	100	4
06	:	Practical II	Sedimentology, Paleontology and Applied Paleobiology	80+20	4		I	1P2		Sedimentology, Paleontology and Applied Paleobiology	100	4
07		Seminar-I		25	1		I	1S1		Seminar-I	25	1
M.Sc. (Tech) Applied Geology CBS Pattern : Semester -II							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Metamorphic Petrology (4)	100	4		II	2T1		Metamorphic Petrology (4)	80+20	4

02		Paper II	Structural Geology, Geodynamics and Tectonics (3+1)	100	4		II	2T2		Structural Geology, Geodynamics and Tectonics (3+1)	80+20	4
03		Paper III	Stratigraphy and Indian Geology (2+2)	100	4		II	2T3		Stratigraphy and Indian Geology (2+2)	80+20	4
04		Paper IV	Precambrian Geology, Geodesy and Mapping (1+2+1)	100	4		VI	6T4		Geodesy and Mapping (Semester VI)	80+20	4
05		Practical I	Metamorphic Petrology and Structural Geology	80+20	4		II	2P1		Metamorphic Petrology and Structural Geology	100	4
06		Practical II	Stratigraphy, Indian Geology, Geodesy, Geological Field Work and Mapping	80+20	4		II	2P2		Stratigraphy, Geochemistry, Geological Field Work and Mapping	100	4
07		Seminar-II	----------	25	1		II	2S1		Seminar-II	25	1
M.Sc. (Tech) Applied Geology CBS Pattern : Semester -III							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Geochemistry (4)	100	4		II	2T4		Geochemistry (Semester II)	80+20	4
02		Paper II	Instrumentation Techniques, Geostatistics and Computer Application in Geology (1+2+1)	100	4		III	3T1		Instrumentation Techniques, Geostatistics and Computer Application in Geology	80+20	4
03		Paper III	Ore Geology (4)	100	4		III	3T3		Ore Geology (4)	80+20	4
04		Paper IV	Mining Geology & Valuation of Mineral Property (2+2)	100	4		III	3T4		Mining Geology & Valuation of Mineral Property (2+2)	80+20	4
05		Practical I	Geochemistry, Instrumentation Techniques, Geostatistics, Computer Application in Geology	80+20	4		III	3P1		Instrumentation Techniques, Geostatistics, Computer Application in Geology	100	4
06		Practical II	Ore Geology, Mining Geology and Valuation of Mineral Property	80+20	4		III	3P2		Ore Geology, Mining Geology and Valuation of Mineral Property	100	4

07		Seminar-III		25	1		III	3S1		Seminar-III	25	1
M.Sc. (Tech) Applied Geology CBS Pattern : Semester -IV							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Indian Mineral Depsoits and Mineral Economics (3+1)	100	4		III	3T2		Indian Mineral Deposits and Mineral Economics (3+1) (Semester III)	80+20	4
02		Paper II	Mineral Exploration (4)	100	4		IV	4T1		Mineral Exploration (4)	80+20	4
03		Paper III	Elements of Mining and Drilling Techniques (3+1)	100	4		IV	4T2		Elements of Mining and Drilling Techniques (3+1)	80+20	4
04		Paper IV	Geomorphology, Remote Sensing and GIS (1+2+1)	100	4		IV	4T3		Geomorphology, Remote Sensing and GIS (1+2+1)	80+20	4
05		Practical I	Mineral Exploration and Mine/ Industrial Training	80+20	4		IV	4P1		Mineral Exploration and Mine/ Industrial Training	100	4
06		Practical II	Geomorphology, Remote Sensing and GIS	80+20	4		IV	4P2		Geomorphology, Remote Sensing and GIS & Fuel Geology	100	4
07			Seminar IV	25	1		IV	4S1		Seminar-IV	25	1
M.Sc. (Tech) Applied Geology CBS Pattern : Semester -V							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Fuel Geology (Coal, Petroleum and Nuclear) (2+1+1)	100	4		IV	4T4		Fuel Geology (Coal, Petroleum and Nuclear) (2+1+1) (Semester IV)	80+20	4
02		Paper II	Ore Microscopy and Ore Dressing (1+3)	100	4		V	5T1		Ore Microscopy and Ore Dressing (1+3)	80+20	4
03		Paper III	Hydrogeology and Watershed Management (3+1)	100	4		V	5T2		Hydrogeology and Watershed Management (3+1)	80+20	4

04		Paper IV	Optional (Any one) Exploration Geochemistry (4)	100	4		V	5T3(1)		Exploration Geochemistry (4)	80+20	4
05		Paper IV	Quaternary Geology & Limnogeology (3+1)	100	4		V	5T3(2)		Quaternary Geology & Limnogeology (3+1)	80+20	4
06		Paper IV	Marine Geology and Oceanography (3+1)	100	4		VI	6T3(3)		Marine Geology and Oceanography (3+1) (Semester VI)	80+20	4
07		Paper IV	Basin Analysis and Sequence Stratigraphy (2+2)	100	4		VI	6T3(2)		Basin Analysis and Sequence Stratigraphy (2+2) (Semester VI)	80+20	4
08		Practical I	Fuel Geology, Ore Microscopy and Ore Dressing	80+20	4		V	5P1		Ore Microscopy, Ore Dressing, Hydrogeology & Watershed Management	100	4
09		Practical II	Hydrogeology, Watershed Management and Optional	80+20	4		V	5P2		Based on paper 5T3 (Core Elective 1 Optional Exploration Geochemistry or Quaternary Geology & Limnogeology) and Environmental Geology	100	4
10			Seminar V	25	1			5S1		Seminar-V	25	1

M.Sc. (Tech) Applied Geology CBS Pattern : Semester -VI							**M.Sc. (Tech) Applied Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Engineering Geology and Geotechniques (3+1)	100	4		VI	6T1		Engineering Geology and Geotechniques (3+1)	80+20	4
02		Paper II	Environmental Geology and Geohazards (3+1)	100	4		V	5T4(1)		Environmental Geology and Geohazards (3+1) (Semester V)	80+20	4
03		Paper III	Applied and Industrial Micropaleontology (4)	100	4		VI	6T2		Applied and Industrial Micropaleontology (4)	80+20	4

04		Paper IV	Petroleum Exploration (4)	100	4		VI	6T3(1)		Petroleum Exploration (4)	80+20	4
05		Practical I	Engineering Geology and Environmental Geology	80+20	4		VI	6P1		Engineering Geology and Applied & Industrial Micropaleontology	100	4
06		Practical II	Micropaleontology, Petroleum Exploration and Geological Field Work	80+20	4		VI	6P2		Based on Paper 6T3 (Core Elective 2 Optional: Petroleum Exploration / Basin Analysis and Sequence Stratigraphy / Marine Geology and Oceanography) Geodesy and Geological Field Work	100	4
07			Seminar VI	25	1		VI	6S1		Seminar-VI	25	1

ANNEXURE M. Sc. Geology

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Geology CBS Pattern : Semester -I							**M.Sc. Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Mineralogy and Crystallography (3+1)	100	4		I	1T1		Mineralogy and Crystallography (3+1)	80+ 20	4
02		Paper II	Igneous Petrology (4)	100	4		I	1T2		Igneous Petrology (4)	80+20	4
03		Paper III	Metamorphic Petrology and Precambrian Geology (3+1)	100	4		I	1T3		Metamorphic Petrology and Geological Mapping (3+1)	80+20	4
04		Paper IV	Stratigraphy and Indian Geology (2+2)	100	4		I	1T4		Stratigraphy and Indian Geology (2+2)	80+20	4
05		Practical I	Mineralogy, Crystallography, Igneous Petrology	80+ 20	4		I	1P1		Mineralogy, Crystallography, Igneous Petrology	100	4
06	:	Practical II	Metamorphic Petrology and Stratigraphy	80+20	4		I	1P2		Metamorphic Petrology, Geological Mapping and Stratigraphy	100	4
07		Seminar-I		25	1		I	1S1		Seminar-I	25	1
M.Sc. Geology CBS Pattern : Semester -II							**M.Sc. Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalen To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Sedimentology, Geostatistics and Computer Application in Geology	100	4		II	2T1		Sedimentology, Geostatistics and Computer Application in	80+20	4

			(3+1)							Geology (3+1)		
02		Paper II	Paleontology and Applied Paleobiology (3+1)	100	4	II	2T2		Paleontology and Applied Paleobiology (3+1)	80+20	4
03		Paper III	Geochemistry & Instrumentation Techniques (3+1)	100	4	II	2T3		Geochemistry & Instrumentation Techniques (3+1)	80+20	4
04		Paper IV	Structural Geology, Geodynamics & Tectonics (3+1)	100	4	II	2T4		Structural Geology, Geodynamics & Tectonics (3+1)	80+20	4
05		Practical I	Sedimentology, Geostatistics, Computer Application in Geology, Paleontology and Applied Paleobiology	80+20	4	II	2P1		Sedimentology, Geostatistics, Computer Application in Geology, Paleontology and Applied Paleobiology	100	4
06		Practical II	Geochemistry, Structural Geology and Geological Field Work and Mapping	80+20	4	II	2P2		Geochemistry, Structural Geology, Geological Field Work and Mapping	100	4
07		Seminar-II	----------	25	1	II	2S1		Seminar-II	25	1

M.Sc. Geology CBS Pattern : Semester -III							**M.Sc. Geology Choice Based Credit System (CBCS)**				
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Fuel Geology (Coal, Petroleum and Nuclear) (2+1+1)	100	4		IV	4T4(1)		Fuel Geology (Coal, Petroleum and Nuclear) (2+1+1) (Semester IV)	80+20	4
02		Paper II	Environemtnal Geology and Engineering Geology (2 + 2)	100	4		III	3T4(1)		Environemtnal Geology and Engineering Geology (2 + 2)	80+20	4
03		Paper III	Geomorphology, Remote Sensing and GIS (1+2+1)	100	4		III	3T2		Geomorphology, Remote Sensing and GIS (1+2+1)	80+20	4
04		Paper IV	Hydrogeology & Watershed Management (3+1)	100	4		III	3T1		Hydrogeology & Watershed Management (3+1)	80+20	4

05		Practical I	Fuel Geology, Environmental Geology & Engineering Geology	80+20	4		III	3P2		Based on Paper 3T3 (Core Elective 1 Mining Geology and Mineral Exploration / Applied & Industrial Micropaleontology / Petroleum Exploration) and Environmental Geology & Engineering Geology	100	4
06		Practical II	Geomorphology, Remote Sensing, GIS, Hydrogeology & Watershed Management	80+20	4		III	3P1		Hydrogeology & Watershed Management, Geomorphology, Remote Sensing & GIS	100	4
07		Seminar-III		25	1		III	3S1		Seminar-III	25	1

M.Sc. Geology CBS Pattern : Semester -IV							**M.Sc. Geology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Ore Geology and Ore Microscopy (3+1)	100	4		IV	4T1		Ore Geology and Ore Microscopy (3+1)	80+20	4
02		Paper II	Indian Mineral Deposits and Mineral Economics (3+1)	100	4		IV	4T2		Indian Mineral Deposits and Mineral Economics (3+1)	80+20	4
03		Paper III	Mining Geology & Mineral Exploration (1+3)	100	4		III	3T3(1)		Mining Geology & Mineral Exploration (1+3) (Semester III)	80+20	4
04		Paper IV	Optional (Any one) 1) Exploration Geochemistry (4)	100	4		IV	4T3(1)		Optional (Any one) 1) Exploration Geochemistry (4)	80+20	4
05		Paper IV	2) Applied and Indusrial Micropaleontology (4)	100	4		III	3T3(2)		2) Applied and Indusrial Micropaleontology (4) (Semester III)	80+20	4
06		Paper IV	3) Petroleum Exploration (4)	100	4		III	3T3(3)		3) Petroleum Exploration (4) (Semester	80+20	4

									III)		
07		Paper IV	4) Quaternary Geology and Limnogeology (3+1)	100	4	IV	4T3(2)		4) Quaternary Geology and Limnogeology (3+1)	80+20	4
07		Paper IV	5) Basin analysis and Sequence Stratigraphy (2+2)	100	4	IV	4T3(3)		5) Basin analysis and Sequence Stratigraphy (2+2)	80+20	4
08		Paper IV	6) Marine Geology and Oceanography (3+1)			IV	4T3(4)		6) Marine Geology and Oceanography (3+1)	80+20	4
09		Practical I	Ore Geology, Ore Microscopy, Mineral Exploration, Optional and Geological Field Work	80+20	4	IV	4P1		Ore Geology, Ore Microscopy, based on Paper 4T3 (Core Elective 2: Exploration Geochemistry/ Quaternary Geology & Limnogeology / Basin analysis and Sequence Stratigraphy /Marine Geology and Oceanography) and Fuel Geology & Geological Field Work	100	4
10		Practical II	Project Work	80+20	4	IV	4PROJ 1		Project	100	4
11			Seminar IV	25	1		4S1		Seminar-IV	25	1

Absorption Scheme for M.Sc. (Mathematics)

Absorption Scheme for M.Sc. MATHEMATICS CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')								**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. (Mathematics) CBS Pattern : Semester –I								**M.Sc. (Mathematics) Choice Based Credit System (CBCS)**					
S. No.	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**	**Equivalence To**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem I		Paper I	Algebra-I	100+25	5		Sem I	1T1	Paper I	Algebra-1	100+25	5
02	Sem I		Paper II	Real Analysis-I	100 +25	5		Sem I	1T2	Paper II	Real Analysis-I	100 +25	5
03	Sem I		Paper III	Topology -I	100+25	5		Sem I	1T3	Paper III	Topology I	100+25	5
04	Sem I		Paper IV	Linear Algebra and Differential Equations	100+25	5		Sem I	1T4	Paper IV	Linear Algebra and Differential Equations	100+25	5
05	Sem I		Paper V	Optional Papers: (i) Numerical Analysis (ii) Integral Equations (iii)Fuzzy Mathematics-I	100+ 25	5		Sem I	1T5	Paper V	Integral Equations	100+25	5
M.Sc. (Mathematics) CBS Pattern : Semester –II								**M.Sc. (Mathematics) Choice Based Credit System (CBCS) :**					
S. No.	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**	**Equivalence To**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem II		Paper VI	Algebra-II	100+25	5		Sem II	2T1	Paper VI	Algebra-II	100+25	5
02	Sem II		Paper VII	Real Analysis-II	100 +25	5		Sem II	2T2	Paper VII	Real Analysis-II	100 +25	5
03	Sem II		Paper VIII	Topology -II	100+25	5		Sem II	2T3	Paper VIII	Topology -II	100+25	5
04	Sem II		Paper IX	Differential Geometry	100+25	5		Sem II	2T4	Paper IX	Differential Geometry	100+25	5
05	Sem II		Paper X	Optional Papers: (i) Classical Mechanics	100+ 25	5		Sem II	2T5	Paper X	Classical Mechanics	100+25	5

				(ii) Mathematical Methods (iii)Fuzzy Mathematics-II										
M.Sc. (Mathematics) CBS Pattern : Semester –III								**M.Sc.(Mathematics) Choice Based Credit System (CBCS)**						
S. No.	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**	**Equivalence To**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem III		Paper XI	Complex Analysis	100 +25	5		Sem III	3T1	Paper XI	Complex Analysis	100+25	5
02	Sem III		Paper XII	Functional Analysis	100 +25	5		Sem III	3T2	Paper XII	Functional Analysis	100+25	5
03	Sem III		Paper XIII	Fluid Dynamics-I	100+25	5		Sem III	3T3	Paper XIII	Fluid Dynamics-I	100+25	5
04	Sem III		Paper XIV	General Relativity	100+25	5		Sem III	3T4	Paper XIV	General Relativity	100+25	5
05	Sem III		Paper XV	Operation Research -I	100+25	5		Sem III	3T4	Paper XV	(Core Subject Centric- I) Operation Research –I	100+25	5
05	Sem III		Paper XV	Algebraic Topology-I	100+25	5		Sem III	3T5	Paper XV	Algebraic Topology-I	100+25	5
06	Sem III		Paper XVI	Operator Theory	100+25	5		Sem III	3T6	Paper XVI	Operator Theory	100+25	5
07	Sem III		Paper XVII	Non Linear Programming	100+25	5		Sem III	3T7	Paper XVII	Non Linear Programming-I	100+25	5
08	Sem III		Paper XVIII	MATLAB Programming	100+25	5		Sem III	3T8	Paper XVIII	Non Linear Programming-I	100+25	5
M.Sc. (Mathematics) CBS Pattern : Semester –IV								**M.Sc.(Mathematics) Choice Based Credit System (CBCS)**						
S. No.	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**	**Equivalence T**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem IV		Paper XIX	Dynamical System	100+25	5		Sem IV	4T1	Paper - XIX	Dynamical System	100+25	5
02	Sem IV		Paper XX	Partial Differential Equations	100+25	5		Sem IV	4T2	Paper XX	Partial Differential Equations	100+25	5

03	Sem IV		Paper XXI	(i) Fluid Dynamics-II	100+25	5		Sem IV	4T3	Paper XXI	Fluid Dynamics-II	100+25	5
04	Sem IV		Paper XXII	(ii) Cosmology	100+25	5		Sem IV	4T4	Paper XXII	Cosmology	80+20	5
05	Sem IV		Paper XXIII	(iii)Operation Research –II	100+25	5		Sem IV	4T4	Paper XXIII	(Core Subject Centric- I) Operation Research –II	100+25	5
05	Sem IV		Paper XIV	(iv)Algebraic Topology-II	100+25	5		Sem IV	4T4	Paper XIV	Algebraic Topology-II	100+25	5
06	Sem IV		Paper XVI	(v) Advanced Algebra	100+25	5		Sem IV	4T4	Paper XVI	Advanced Algebra	100+25	5
07	Sem IV		Paper XVII	(vi) Banach Algebra	100+25	5		Sem IV	4T4	Paper XVII	Advanced Algebra	100+25	5
08	Sem IV		Paper XVIII	(vii) Computational Fluid Dynamics	100+25	5		Sem IV	4T4	Paper XVIII	Non Linear Programming-II	100+25	5

ANNEXURE M. Sc. MICROBIOLOGY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Microbiology CBS Pattern : Semester -I							**M.Sc. Microbiology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	MB1-T001	Paper I	MICROBIAL DIVERSITY AND EVOLUTION (MDE)	100	4		Sem - III	3T3	Paper III	MICROBIAL DIVERSITY, EVOLUTION AND ECOLOGY (MDEE) – 1	80+ 20	4
02	MB1-T002	Paper II	MICROBIAL METABOLISM (MM)	100	4		Sem -I	1T1	Paper I	MICROBIAL METABOLISM (MM)	80+20	4
03	MB1-T003	Paper III	ENZYMOLOGY AND TECHNIQUES (ET)	100	4		Sem -I	1T2	Paper II	ENZYMOLOGY AND TECHNIQUES (ET)	80+20	4
04	MB1-T004	Paper IV	MICROBIAL ECOLOGY (ME)	100	4		Sem - IV	4T3	Paper III	MICROBIAL DIVERSITY, EVOLUTION AND ECOLOGY (MDEE) – 2	80+20	4
05	MB1-LAB1	Practical-I	LABORATORY EXERSICE 1	80+ 20	4		Sem -I	1P1	Practical - I	LABORATORY EXERSICE - 1	100	4
06	MB1-LAB2	Practical-II	LABORATORY EXERSICE 2	80+20	4		Sem - II	2P2	Practical - III	LABORATORY EXERSICE - 2	100	4
07	MB1-INT1	Seminar-I	SEMINAR	25	1		Sem -I	1S1	SEMINAR	SEMINAR	25	1
M.Sc. Microbiology CBS Pattern : Semester -II							**M.Sc. Microbiology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	MB2-T005	Paper V	ADVANCE TECHNIQUES IN MICROBIOLOGY (ATM)	100	4		Sem -I	1T3	Paper III	ADVANCE TECHNIQUES IN MICROBIOLOGY (ATM)	80+20	4

02	MB2-T006	Paper VI	MEMBRANE STRUCTURE AND SIGNAL TRANSDUCTION (MSST)	100	4	Sem -I	1T4	Paper IV	MEMBRANE STRUCTURE AND SIGNAL TRANSDUCTION (MSST)	80+20	4
03	MB2-T007	Paper VII	MICROBIAL METHODS FOR ENVIRONMENT MANAGEMENT (MMEM)	100	4	Sem - II	2T1	Paper I	MICROBIAL METHODS FOR ENVIRONMENT MANAGEMENT (MMEM)	80+20	4
04	MB2-T008	Paper VIII	MICROBIAL METABOLITES (MMT)	100	4	Sem - II	2T2	Paper II	MICROBIAL METABOLITES (MMT)	80+20	4
05	MB2-LAB3	Practical-III	LABORATORY EXERSICE 3	80+20	4	Sem – I	1P2	Practical - II	LABORATORY EXERSICE 2	100	4
06	MB2-LAB4	Practical-IV	LABORATORY EXERSICE 4	80+20	4	Sem – I	1P1	Practical - I	LABORATORY EXERSICE 1	100	4
07	MB2-INT2	Seminar-II	SEMINAR	25	1	Sem - II	2S1	SEMINAR	SEMINAR	25	1

M.Sc. Microbiology CBS Pattern : Semester -III

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	MB3-T009	Paper IX	MEDICAL MICROBIOLOGY AND PARASITOLOGY (MMP)	100	4
02	MB3-T010	Paper X	IMMUNOLOGY AND IMMUNODIAGNOSTICS (IID)	100	4
03	MB3-T011	Paper XI	BIOINFORMATICS (BIF)	100	4
04	MB3-T012	Paper XII	MICROBIAL FERMENTATION TECHNOLOGY (MFT)	100	4

Equivalence To

M.Sc. Microbiology Choice Based Credit System (CBCS)

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
Sem - II	2T3	Paper III	MEDICAL MICROBIOLOGY AND PARASITOLOGY (MMP)	80+20	4
Sem - II	2T4	Paper IV	IMMUNOLOGY AND IMMUNODIAGNOSTICS (IID)	80+20	4
Sem - III	3T3	Paper III	BIOINFORMATICS (BIF) - 1	80+20	4
Sem - IV	4T2	Paper II	MICROBIAL FERMENTATION TECHNOLOGY (MFT)	80+20	4

05	MB3-LAB5	Practical V	LABORATORY EXERSICE 5	80+20	4	Sem - II	2P1	Practical – III	LABORATORY EXERSICE 1	100	4
06	MB3-LAB6	Practical VI	LABORATORY EXERSICE 6	80+20	4	Sem - II	2P2	Practical – IV	LABORATORY EXERSICE 2	100	4
07	MB3-INT3	Seminar-III	SEMINAR	25	1	Sem - III	3S1	Seminar	Seminar	25	1

M.Sc. Chemistry Microbiology CBS Pattern : Semester -IV							**M.Sc. Subject Microbiology Choice Based Credit System (CBCS)**				
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	MB4-T013	Paper XIII	MOLECULAR BIOLOGY AND GENETICS (MBG)	100	4		Sem - III	3T1	Paper I	MOLECULAR BIOLOGY AND GENETICS (MBG)	80+20	4
02	MB4-T014	Paper XIV	VIROLOGY (VIR)	100	4		Sem - IV	4T1	Paper I	VIROLOGY (VIR)	80+20	4
03	MB4-T015	Paper XV	DRUGS, VACCINES AND DELIVERY SYSTEMS (DVD)	100	4		Sem - III	3T4	Paper IV	DRUG AND DISEASE MANAGEMENT (DDM)	80+20	4
04	MB4-T016	Paper XVI	RECOMBINANT DNA TECHNOLOGY (RDT)	100	4		Sem - III	3T2	Paper II	RECOMBINANT DNA TECHNOLOGY AND NANOBIOTECHNOLOGY (RDTN)	80+20	4
05	MB4-LAB7	Practical VII	LABORATORY EXERSICE 7	80+20	4		Sem - III	3P1	Practical – V	LABORATORY EXERSICE 1	100	4
06	MB4-PROJ	Project	PROJECT WORK	80+20	4		Sem - IV	4PROJ 1	PROJECT	PROJECT WORK	100	4
07	MB4-INT4	Seminar IV	SEMINAR	25	1		Sem - IV	4S1	SEMINAR	SEMINAR	25	1

ANNEXURE M. Sc. STATISTICS

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Statistics.. CBS Pattern : Semester -I							**M.Sc. Statistics Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	MST 101	Paper I	Elements of Mathematical Analysis	100	4		I	1T1	Paper I	Elements of Mathematical Analysis	80+ 20	4
02	MST 102	Paper II	Distribution Theory	100	4		I	1T2	Paper II	Distribution Theory	80+20	4
03	MST 103	Paper III	Estimation Theory	100	4		I	1T3	Paper III	Estimation Theory	80+20	4
04	MST 104	Paper IV	Sampling Theory	100	4		I	1T4	Paper IV	Sampling Theory	80+20	4
05	Practical - I	Practical-I	Practical - I	80+ 20	4		I	1P1	Practical I	Practical - I	100	4
06	Practical - II	Practical-II	Practical - II	80+20	4		I	1P2	Practical II	Practical - II	100	4
07	Seminar	Seminar-I		25	1		I	1S1	Seminar	Seminar-I	25	1
M.Sc. Statistics CBS Pattern : Semester -II							**M.Sc. Statistics Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	MST 201	Paper I	Probability Theory	100	4		II	2T1	Paper I	Probability Theory	80+20	4
02	MST 202	Paper II	Elementary Stochastic Processes	100	4		II	2T2	Paper II	Elementary Stochastic Processes	80+20	4
03	MST 203	Paper III	Testing of Hypothesis	100	4		II	2T3	Paper III	Testing of Hypothesis	80+20	4

04	MST 204	Paper IV	Linear Models and Designs of Experiments	100	4		II	2T4	Paper IV	Linear Models and Designs of Experiments	80+20	4
05	Practical I	Practical-I	Practical - I	80+20	4		II	2P1	Practical I	Practical - I	100	4
06	Practical II	Practical-II	Practical - II	80+20	4		II	2P2	Practical II	Practical - II	100	4
07	Seminar	Seminar	----------	25	1		II	2S1	Seminar	Seminar-II	25	1

M.Sc. Statistics CBS Pattern : Semester -III

M.Sc. Statistics Choice Based Credit System (CBCS)

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits	Equivalence To	Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
01	MST 301	Paper I	Decision Theory and Non parametric Methods	100	4		III	3T1	Paper I	Decision Theory and Non parametric Methods	80+20	4
02	MST 302	Paper II	Linear and Nonlinear Modeling	100	4		III	3T2	Paper II	Linear and Nonlinear Modeling	80+20	4
03	MST 303	Paper III	Mathematical Programming	100	4		III	3T3-A	Paper III	Mathematical Programming	80+20	4
04	MST 304	Paper IV	Industrial Process and Quality Control	100	4		III	3T4-A	Paper IV	Industrial Process and Quality Control	80+20	4
05	Practical I	Practical I	Practical - I	80+20	4		III	3P1	Practical I	Practical - I	100	4
06	Practical II	Practical II	Practical - II	80+20	4		III	3P2	Practical II	Practical - II	100	4
07	Seminar	Seminar-III	Seminar	25	1		III	3S1	Seminar	Seminar-III	25	1

M.Sc. Statistics CBS Pattern : Semester -IV

M.Sc. Statistics Choice Based Credit System (CBCS)

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits	Equivalence To	Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
01	MST 401	Paper I	Multivariate Analysis	100	4		IV	4T1	Paper I	Multivariate Analysis	80+20	4
02	MST 402	Paper II	Computational Statistics	100	4		IV	4T2	Paper II	Computational Statistics	80+20	4

03	MST 403	Paper III	Operations Research	100	4		IV	4T3 -A	Paper III	Operations Research	80+20	4
04	MST 404	Paper IV	Industrial Statistics	100	4		IV	4T4- A	Paper IV	Industrial Statistics	80+20	4
05	Practical I	Practical I	Practical - I	80 + 20	4		IV	4P1	Practical I	Practical - I	100	4
06	Practical II	Project	Project	80+20	4		IV	4PROJ 2	Project	Project	100	4
07	Seminar	Seminar	Seminar	25	1		IV	4S1	Seminar	Seminar IV	25	1

ANNEXURE M. Sc. CHEMISTRY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern(introduced in the year 2015-16 at M.Sc. Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 3 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Subject CHEMISTRY CBS Pattern : Semester -I							**M.Sc. Subject CHEMISTRYChoice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	CH-101:	Paper I	(Inorganic Chemistry)	100	4		Sem I	1T1	Paper I	(Inorganic Chemistry)	80+ 20	4
02	CH-102:	Paper II	(Organic Chemistry)	100	4		Sem I	1T2	Paper II	(Organic Chemistry)	80+20	4
03	CH-103:	Paper III	(Physical Chemistry)	100	4		Sem I	1T3	Paper III	(Physical Chemistry)	80+20	4
04	CH-104:	Paper IV	(Analytical Chemistry)	100	4		Sem I	1T4	Paper IV	(Analytical Chemistry)	80+20	4
05	CH-105:	Practical-I	(Inorganic Chemistry)	80+ 20	4		Sem I	1P1	Practical-I	(Inorganic Chemistry)	100	4
06	CH-106:	Practical-II	(Physical Chemistry)	80+20	4		Sem I	1P3	Practical-II	(Physical Chemistry)	100	4
07	CH-107:	Seminar-I	Seminar-I	25	1		Sem I	1S1	Seminar-I	Seminar-I	25	1

M.Sc. Subject: CHEMISTRY CBS Pattern : Semester -II							M.Sc. Subject: CHEMISTRY Choice Based Credit System (CBCS)					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	CH-201:	Paper V	(Inorganic Chemistry)	100	4		Sem II	2T1	Paper V	(Inorganic Chemistry)	80+20	4
02	CH-202:	Paper VI	(Organic Chemistry)	100	4		Sem II	2T2	Paper VI	(Organic Chemistry)	80+20	4
03	CH-203:	Paper VII	(Physical Chemistry)	100	4		Sem II	2T3	Paper VII	(Physical Chemistry)	80+20	4
04	CH-204:	Paper VIII	(Analytical Chemistry)	100	4		Sem II	2T4	Paper VIII	(Analytical Chemistry)	80+20	4
05	CH-205:	Practical-III	(Organic Chemistry)	80+20	4		Sem II	2P2	Practical-III	(Organic Chemistry)	100	4
06	CH-206:	Practical-IV	(Analytical Chemistry)	80+20	4		Sem II	2P4	Practical-IV	(Analytical Chemistry)	100	4
07	CH-207:	Seminar-II	Seminar-II	25	1		Sem II	2S1		Seminar-II	25	1

M.Sc. Subject: CHEMISTRY CBS Pattern : Semester -III							M.Sc. Subject CHEMISTRY Choice Based Credit System (CBCS)					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	CH-301:	Paper IX	(Spectroscopy)	100	4		Sem III	3T4*	Paper -XII	Core Subject Centric Spectroscopy - I	80+20	4
02	CH-302:	Paper X	(Special I-Inorganic /Organic/ Physical/Analytical)	100	4		Sem III	3T1	Paper IX	(Special I-Inorganic /Organic/ Physical/Analytical)	80+20	4
03	CH-303:	Paper XI	(Special II-Inorganic /Organic/ Physical/Analytical)	100	4		Sem III	3T2	Paper X	(Special II-Inorganic /Organic/ Physical/Analytical)	80+20	4
04	CH-304:	Paper XII	(Elective- Nuclear/ Environmental/Polymer/Medicinal)	100	4		Sem III	3T3	Paper XI	(Elective- Nuclear/ Environmental /Polymer/Medicinal	80+20	4
05	CH-304	Paper XII	Elective-Applied Analytical	100	4		Sem III	3T4#	Paper-XII	Foundation CourseApplied Analytical Chemistry -I	80+20	4
06	CH-305:	Practical V	Special (Inorganic /Organic/ Physical/Analytical)	80+20	4		Sem III	3P1	Practical V-	Special (Inorganic /Organic/ Physical/Analytical)	100	4
07	CH-306:	Practical VI	Elective (Applied Analytical/ Nuclear/ Environmental/Polymer/Medicinal)	80+20	4		Sem III	3P3	Practical VI– Elective	Elective (Nuclear/Environmental/ Polymer/Medicinal)	100	4
08	CH-307	Seminar-III	Seminar-III	25	1		Sem III	3S1	Seminar-III	Seminar-III	25	1

*Core Subject Centric –I; # Foundation Course

M.Sc. Chemistry CHEMISTRY CBS Pattern : Semester -IV						Equivalence To	M.Sc. Subject CHEMISTRY Choice Based Credit System (CBCS)					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**		**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	CH-401:	Paper XIII	(Spectroscopy)	100	4		Sem IV	4T4**	Paper -XVI	Core Subject Centric Spectroscopy-II	80+20	4
02	CH-402:	Paper XIV	(Special I-Inorganic /Organic/ Physical/Analytical)	100	4		Sem IV	4T1	Paper XIII	(Special I-Inorganic /Organic/ Physical/Analytical)	80+20	4
03	CH-403:	Paper XV	(Special II-Inorganic /Organic/ Physical/Analytical)	100	4		Sem IV	4T2	Paper XIV	(Special II-Inorganic /Organic/ Physical/Analytical)	80+20	4
04	CH-404:	Paper XVI	(Elective- Nuclear/ Environmental/Polymer/Medicinal)	100	4		Sem IV	4T3	Paper XI	(Elective- Nuclear/ Environmental /Polymer/Medicinal	80+20	4
05	CH-404	Paper XVI	Elective-Applied Analytical				Sem IV	4T4#	Paper-XII	Foundation CourseApplied Analytical Chemistry -I	80+20	4
05	CH-405:	Practical VII	Special (Inorganic /Organic/ Physical/Analytical)	80+20	4		Sem IV	4P1	Practical VII	Special (Inorganic /Organic/ Physical/Analytical)	100	4
06	CH-406:	Project	Project	80+20	4		Sem IV	4PROJ1	Project	Special (Inorganic /Organic/ Physical/Analytical)	100	4
07	CH-407	Seminar IV	Seminar IV				Sem IV	4S1	Seminar-IV	Seminar-IV	25	1

**Core Subject Centric – II; # Foundation Course

ANNEXURE M. Sc. BIOTECHNOLOGY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. BIOTECHNOLOGY CBS Pattern : Semester -I							**M.Sc. BIOTECHNOLOGY Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	-	Paper I	Cell Biology and Enzymology	100	4		Sem I	(Core1) 1T1	Paper I	Cell Biology and Enzymology	80+ 20	4
02	-	Paper II	Molecular Biology	100	4		Sem I	(Core2) 1T2	Paper II	Molecular Biology	80+20	4
03	-	Paper III	Biomolecules	100	4		Sem I	(Core3) 1T3	Paper III	Biomolecules	80+20	4
04	-	Paper IV	Biophysical Technique	100	4		Sem I	(Core4) 1T4	Paper IV	Biophysical Technique	80+20	4
05	-	Practical-I	Cell Biology & Enzymology	80+ 20	4		Sem I	(Pract. Core 1&2) 1P1	Practical-I	Cell Biology & Enzymology	100	4
06	-	Practical-II	Macromolecules & Analytical Techniques	80+20	4		Sem I	(Pract. Core 3&4) 1P2	Practical-II	Macromolecules & Analytical Techniques	100	4
07	-	Seminar-I		25	1		Sem I	(Seminar-1) 1S1	Seminar-I	Seminar-I	25	1
M.Sc. BIOTECHNOLOGY CBS Pattern : Semester -II							**M.Sc. BIOTECHNOLOGY Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	-	Paper V	Microbiology	100	4		Sem II	(Core5) 2T1	Paper I	Microbiology	80+20	4
02	-	Paper VI	Industrial Biotechnology and Biostatistics	100	4		Sem III	(Core Elective 1) 3T3	Paper III	(Core Elective A) Industrial Biotechnology I	80+20	4

03	-	Paper VII	Immunology	100	4
04	-	Paper VIII	Molecular Biology & Bioinformatics	100	4
05	-	Practical-III	Microbiology & Immunology	80+20	4
06	-	Practical-IV	Molecular Biology & Bioinformatics	80+20	4
07	-	Seminar-II	----------	25	1

M.Sc. BIOTECHNOLOGY CBS Pattern : Semester -III

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	-	Paper IX	Animal Biotechnology	100	4
02	-	Paper X	Plant Biotechnology	100	4
03	-	Paper XI	Genetic Engineering-I	100	4
04	-	Paper XII	Genetic Engineering-II	100	4
05	-	Practical V	Animal & Plant Biotechnology	80+20	4
06	-	Practical VI	Genetic Engineering	80+20	4
07	-	Seminar-III		25	1

Equivalence To

M.Sc. BIOTECHNOLOGY Choice Based Credit System (CBCS)

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
Sem II	(Core 6) 2T2	Paper II	Immunology	80+20	4
Sem II	(Core8) 2T4	Paper IV	Applied Molecular Biology	80+20	4
Sem II	(Pract. Core 5&6) 2P1	Practical-III	Microbiology & Immunology	100	4
Sem II	(Pract. Core 7&8) 2P2	Practical-IV	Genetic Engineering & Molecular Biology	100	4
Sem II	(Seminar-2) 2S1	Seminar 1	Seminar-II	25	1

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
Sem-IV	(Core11) 4T1	Paper IX	Animal Biotechnology	80+20	4
Sem-III	(Core10) 3T2	Paper X	Plant Biotechnology	80+20	4
Sem-II	(Core7) 2T3	Paper XI	Fundamentals of Genetic Engineering	80+20	4
Sem-III	(Core9) 3T4	Paper XII	Genetic Engineering and its Applications	80+20	4
Sem-III	(Pract. Core 9&10) 3P1	Practical V	Genetic Engineering & Plant Biotechnology	100	4
Sem-II	(Pract. Core 7&8) 2P2	Practical VI	Genetic Engineering & Molecular Biology	100	4
Sem-III	(Seminar-3) 3S1	Seminar-III	Seminar-III	25	1

M.Sc. BIOTECHNOLOGY CBS Pattern : Semester -IV					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	-	Paper XIII	Environmental Science & Bioresources	100	4
02	-	Paper XIV	Applied Environmental Biotechnology	100	4
03	-	Paper XV	Environmental Monitoring & Management	100	4
04	-	Paper XVI	Ethics, Patenting and Bio-Entrepreneurship	100	4
05	-	Practical VII	Environmental Biotechnology	80+20	4
06	-	Project	Project Work	80+20	4
07	-		Seminar IV		

Equivalence To

M.Sc. BIOTECHNOLOGY Choice Based Credit System (CBCS)					
Sem	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
Sem-III	(Core Elective 1) 3T3	Paper XIII	(Core Elective B) Environmental Biotechnology-I	80+20	4
Sem-IV	(Core Elective 2) 4T3	Paper XIV	(Core Elective B) Environmental Biotechnology-II	80+20	4
Sem-III	(Core Elective 1) 3T3	Paper XV	(Core Elective B) Environmental Biotechnology-I	80+20	4
Sem-IV	(Core 12) 4T2	Paper XVI	Biostatistics , Bioinformatics, Ethics & Patenting	80+20	4
Sem-III	(Pract. Core Elective 1) 3P2	Practical VII	Industrial Biotechnology OR Environmental Biotechnology	100	4
Sem-IV	4PROJ1	Project	Project Work	100	4
Sem-IV	(Seminar-4) 4S1	Seminar IV	Seminar-IV	25	1

ANNEXURE M. Sc. BIOCHEMISTRY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Biochemistry CBS Pattern : Semester -I							**M.Sc. Biochemistry Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	BCH1T001	Paper I	Biophysical Techniques	100	4		**I**	1T3	Paper I	Biochemical Research Techniques	80+ 20	4
02	BCH1T002	Paper II	Protein Biochemistry	100	4		**I**	1T1	Paper II	Protein Biochemistry	80+20	4
03	BCH1T003	Paper III	Advanced Enzymology	100	4		**I**	1T2	Paper III	Advanced enzymology	80+20	4
04	BCH1T004	Paper IV	Plant Biochemistry	100	4		**I**	1T4	Paper IV	Plant Biochemistry	80+20	4
05	BCH1 LAB1	Practical-I	AnalyticalBiochemistry & Enzymology	80+ 20	4		**I**	1P1	Pract.-I	ProteinBiochemistry & Enzymology	100	4
06	BCH1 LAB2	Practical-II	Plant Biochemistry	80+20	4		**I**	1P2	Pract.-II	Biochemical ResearchTechniques & Plant Biochemistry	100	4
07	BCH1INT1	Seminar-I	Internal Assessment (Seminar)	25	1		**I**	1S1	Seminar	Seminar-I	25	1
M.Sc. Biochemistry CBS Pattern : Semester -II							**M.Sc. Biochemistry Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	BCH2T005	Paper V	Cellular & Molecular Immunology	**100**	**4**		II	2T1	Paper I	Cellular&Molecular Immunology	**80+20**	4
02	BCH2T006	Paper VI	Cell & Molecular BiologyTechniques	**100**	**4**		**III**	3T4	Paper II	Bioresearch Techniques	**80+20**	**4**

03	BCH2T007	Paper VII	Clinical Biochemistry	**100**	**4**
04	BCH2T008	Paper VIII	Molecular Biology	**100**	**4**
05	BCH2LAB 3	Practical-III	Cell & Molecular Biology	**80+20**	**4**
06	BCH2LAB 4	Practical-IV	Clinical Biochemistry	**80+20**	**4**
07	BCH2INT2	Seminar-II	Internal Assessment(Seminar)	**25**	**1**

II	2T2	Paper III	Clinical Biochemistry	**80+20**	**4**
II	2T4	Paper IV	Molecular Biology	**80+20**	**4**
II	2P2	Pract I	Cell & Molecular Biology	**100**	**4**
II	2P1	Pract. II	Clinical Biochemistry & Immunology	**100**	**4**
II	2S1	Seminar	Seminar	**25**	**1**

M.Sc. Biochemistry CBS Pattern : Semester -III

M.Sc. Biochemistry Choice Based Credit System (CBCS)

S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	BCH3T009	Paper IX	Advanced Molecular Biology	**100**	**4**
02	BCH3T001 0	Paper X	Biotechnology	**100**	**4**
03	BCH3T011	Paper XI	Immunology	**100**	**4**
04	BCH3T001 2	Paper XII	Biochemical & Environmental Toxicology	**100**	**4**
05	BCH3LAB 5	Practical V	Biotechnology & Immunological techniques	**80+20**	**4**
06	BCH3LAB 6	Practical VI	Biochemical & Environmental Toxicology	**80+20**	**4**
07	BCH3INT3	Seminar-III	Internal Assessment (PreProject presentation for approval)	**25**	**1**

Equivalence To

Sem	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
III	3T1	**Paper I**	Advanced Molecular Biology	**80+20**	**4**
III	3T2	**Paper II**	Biotechnology	**80+20**	**4**
IV	4T2	**Paper III**	Advanced Immunology	**80+20**	**4**
III	3T3	**Paper IV**	Biochemical & Environmental Toxicology	**80+20**	**4**
III	3P1	Pract. I	Biotechnology & Molecular Biology	**100**	**4**
III	3P2A	**Pract II**	Toxicology (Biochemical & Environmental Toxicology)	**100**	**4**
III	3S1	3S1	Seminar	**25**	**1**

M.Sc. Biochemistry CBS Pattern : Semester -IV

M.Sc. Biochemistry Choice Based Credit System (CBCS)

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	BCH4T0013	Paper XIII	Advanced Clinical Biochemistry	**100**	**4**
02	BCH4T014	Paper XIV	Cell Biology & Cellular Biochemistry	**100**	**4**
03	BCH4T0015	Paper XV	Nutrition & Biochemistry of Movements	**100**	**4**
04	BCH4T0016	Paper XVI	Biostatistics, Research methodology, Technical writing, Computers & Bioinformatics	**100**	**4**
05	♠**BCH4LAB7**	Practical VII	♠**Biostatistics, Bioinformatics & Cell biology**	**80+20**	**4**
05	BCH4PROJ	Project	Project Work	**80+20**	**4**
06	BCH4INT4	Seminar IV	Internal Assessment (Final Project Presentation)	**25**	**1**

Equivalence To

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
IV	4T1	**Paper I**	Advanced Clinical Biochemistry	**80+20**	**4**
II	2T3	**Paper II**	Cell Biochemistry	**80+20**	**4**
III	3T3B	**Paper III**	Nutritional Biochemistry	**80+20**	**4**
I	1T3	**Paper IV**	Biochemical Research Techniques	**80+20**	**4**
IV	**BCH 4 LAB7** ♠	Pract. I	♠**Biostatistics , & Cell Bioinformatics biology**	**100**	**4**
IV	4PROJ1	**Project**	Project work	**100**	**4**
IV	4S1	**4S1**	Seminar	**25**	**1**

ANNEXURE M. Sc. BOTANY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

	If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
	M.Sc. Botany CBS Pattern Semester I							**M.Sc. Botany Choice Based Credit System(CBCS) pattern**					
Sr. No.	**Semester**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	**I**	BOT T I	Paper I	Microbiology, Algae and Fungi	**100**	**4**		**I**	1T1	Paper I	Microbiology, Algae and Fungi	**80+ 20**	**4**
02	**I**	BOT T II	Paper II	Bryophytes and Pteridophytes	**100**	**4**		**I**	1T2	Paper II	Bryophytes and Pteridophytes	**80+20**	**4**
03	**I**	BOT T III	Paper III	Gymnosperms and Paleobotany	**100**	**4**		**I**	1T3	Paper III	Gymnosperms and Paleobotany	**80+20**	**4**
	04 I	BOT T IV	Paper IV	Cytology and Genetics	**100**	**4**		**I**	1T4	Paper IV	Cytology and Genetics	**80+20**	**4**
05	**I**	BOT P I	Practical -I		**80+ 20**	**4**		**I**	1P1	Practical-I		**100**	**4**
06	**I**	BOT P II	Practical -II		**80+20**	**4**		**I**	1P2	Practical-II		**100**	**4**
07	**I**	Seminar I	Seminar -I		**25**	**1**		**I**	1S1	Seminar-I		**25**	**1**
	M.Sc. Botany CBS Pattern: Semester II							**M.Sc. Botany Choice Based Credit System (CBCS)**					
01	**II**	BOT T V	Paper V	Plant physiology and Biochemistry	**100**	**4**	Equivalence To	**II**	2T1	Paper V	Plant physiology and Biochemistry	**80+20**	**4**
02	**II**	BOT T VI	Paper VI	Plant Development and Reproduction	**100**	**4**		**II**	2T2	Paper VI	Plant Development and Reproduction	**80+20**	**4**
03	**II**	BOT T VII	Paper VII	Cell and Molecular Biology- I	**100**	**4**		**II**	2T3	Paper VII	Cell and Molecular Biology- I	**80+20**	**4**
	04 II	BOT T VIII	Paper VIII	Angiosperms- I	**100**	**4**		**II**	2T4	Paper VIII	Angiosperms - I & Ethnobotany	**80+20**	**4**
05	**II**	BOT	Practic		**80+20**	**4**		**II**	2P1	Practical-III		**100**	**4**

		P III	al-III										
06	**II**	BOT P IV	Practical-IV		**80+20**	**4**		**II**	2P2	Practical-IV		**100**	**4**
07	**II**	Seminar-II	Seminar-II		**25**	**1**		**II**	2S1	Seminar-II		**25**	**1**
	M.Sc. Botany CBS Pattern: Semester III							**M.Sc. Botany Choice Based Credit System(CBCS)**					
01	**III**	BOT T IX	Paper IX	Plant Ecology	**100**	**4**	Equivalence To	**III**	3T1	Paper IX	Plant Ecology and Conservation Biology	**80+20**	**4**
02	**III**	BOT T X	Paper X	Cell and Molecular Biology- II	**100**	**4**		**IV**	4T1	Paper XIII	Cell and Molecular Biology-II	**80+20**	**4**
03	**III**	BOT T XI	Paper XI	Plant Biotechnology	**100**	**4**		**IV**	4T2	Paper XIV	Plant Biotechnology and Plant Breeding	**80+20**	**4**
04	**III**	BOT T XII	Paper XII	Angiosperms- II	**100**	**4**		**III**	3T2	Paper X	Angiosperms-II	**80+20**	**4**
05	**III**	BOT P V	Practical V		**80+20**	**4**		**III**	3P1	Practical V		**100**	**4**
06	**III**	BOT P VI	Practical VI		**80+20**	**4**		**III**	3P2	Practical VII		**100**	**4**
07	**III**	Seminar-III	Seminar-III		**25**	**1**		**III**	3S1	Seminar-III	------	**25**	**1**
	M.Sc. Botany CBS Pattern: Semester IV							**M.Sc. Botany Choice Based Credit System(CBCS)**					
01	**IV**	BOT T XIII	Paper XIII	Plant conservation, IPR and Ethnobotany	**100**	**4**	Equivalence To	**II III**	2T4 3T1	Paper VIII Paper IX	Angiosperms - I & Ethnobotany Plant Ecology and Conservation Biology	**80+20**	**4**
02	**IV**	BOT T XIV	Paper XIV	Pl. Res. Uti., Bioethics, Biosafety, Pl. Breed. & Biostat.	**100**	**4**		**IV**	4T2	Paper XIV	Plant Biotechnology and Plant Breeding	**80+20**	**4**
03	**IV**	BOT T XV	Paper XV	Elective –I	**100**	**4**		**III**	3T3	Paper XI	Elective –I	**80+20**	**4**
04	**IV**	BOT	Paper	Elective –II	**100**	**4**		**IV**	4T3	Paper XV	Elective –II	**80+20**	**4**

		T XVI	XVI										
05		BOT P VII	Practical VII		**80+20**	**4**		III	3P2	Practical VI		**100**	**4**
06		BOT P VIII	Project		**80+20**	**4**		IV	4PROJ1	Project		**100**	**4**
07		Seminar IV	Seminar IV						4S1	Seminar-IV		**25**	**1**

ANNEXURE M. Sc. Molecular Biology and Genetic Engineering

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. MBGE CBS Pattern : Semester -I							**M.Sc. MBGE Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	1T	Paper I	Cell Biology	100	4		I	1T1	Paper I	Cell Biology	80+ 20	4
02	II T	Paper II	Basic Biochemistry	100	4		I	1T2	Paper II	Basic Biochemistry	80+20	4
03	IIIT	Paper III	Practical Biochemistry And Analytical Techniques	100	4		II	2T1	Paper I	Biophysical Analytical Techniques	80+20	4
04	IV T	Paper IV	Molecular Biology I	100	4		I	1T3	Paper III	Molecular Biology I	80+20	4
05	V T	Paper V	Molecular Biology II	100	4		1	I T 4	Paper IV	Molecular Biology II		
05	1P	Practical-I	Based On Course I,II,III	80+ 20	4			I PI	Practical-I	Based On Course I,II	100	4
06	: II P	Practical-II	Based On Course IV,V	80+20	4			I PII	Practical-II	Based On Course III & IV	100	4
07										Seminar-I	25	1
M.Sc. MBGE CBS Pattern : Semester -II							**M.Sc. MBGE Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	VI T	Paper VI	Enzyme Technology	100	4		II	2T2	Paper II	Enzyme Technology & Immunology	80+20	4

02	VII T	Paper VII	Recombinent DNA Tech. I	100	4		III	3T2	Paper II	Recombinent DNA Tech. I	80+20	4
04	VIII T	Paper VIII	Recombinent DNATech. II	100	4		IV	4T2	Paper II	Recombinent DNA Tech. II	80+20	4
	IX T	Paper IX	IPR,Biosafety,Bioethics, Entrepreneurship	100	4		II	2T3	Paper III	IPR,Biosafety,Bioethics, Entrepreneurship	80+20	4
	XT	Paper X	Immunology	100	4		II	2T2	Paper II	Enzyme Technology And Immunology	80+20	4
05	III(P)	Practical-III	Based On 6 &10	80+20	4			2P1	Practical-III	Based On 2T2	100	4
06	IV(P)	Practical-IV	Based On 7,8,9	80+20	4			2P2	Practical-IV	Based On 2t3,3t2	100	4
07				25	1				Seminar-II	Seminar-II	25	1

M.Sc. MBGE CBS Pattern : Semester -III							**M.Sc. MBGE Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	XI(T)	Paper XI	Bioinformatics And Datamining	100	4		II	2T4	IV	Bioinformatics And Datamining, Lab Management And Safety	80+20	4
02	XII(T)	Paper XII	Bioststistics, Lab Management And Safety	100	4		III	3T4	IV	Foundation Course[Biostatistics]+ Bioinformatics And Datamining, Lab Management And Safety	80+20	4
03	XIII(T)	Paper XIII	Plant Genetic Engineering	100	4		IV	4T1	I	Plant & Animal Genetic Engineering	80+20	4
04	XIV(T)	Paper XIV	- Animal Genetic Engineering	100	4		IV	4T1	1	Plant &Animal Genetic Engineering	80+20	4
05	XV(T)	Paper XV	-Industrial Application Of Genetic Engineering	100	4		III	3T1	I	Industrial Application Of Genetic Engineering	80+20	4
06	V(P)	Practical V	Course XI-XII	80+20	4			3P1	Practical V	Course IX-X	100	4
07	VI(P)	Practical VI	Course XIII- XV	80+20	4			3P2	Practical VI	Course XI	100	4

08								3SI		Seminar-III	25	1
M.Sc. MBGE CBS Pattern : Semester -IV						**M.Sc. MBGE Choice Based Credit System (CBCS)**						
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
06		Project	Project	100	8			4PROJ1		Project	100	4
07			Seminar IV	50	2					Seminar-IV	25	1

NOTE- ELECTIVE PAPER WAS NOT OPERATIVE IN THE CBS HENCE NO NEED OF EQUIVALENCE.
IN CBS FOURTH SMESTER WAS FOR ONLY PROJECT AND SEMINAR
NO SEMINAR IN THE I,II,III SEMESTER IN CBS SYSTEM.

ANNEXURE M. Sc. MEDICINAL PLANTS

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

	If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
	M.Sc. Medicinal Plants CBS Pattern Semester I							**M.Sc. Medicinal Plants Choice Based Credit System(CBCS)**					
Sr. No.	**Semester**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equiva-lence To**	**Semester**	**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	**I**	T I	Paper I	Indian System of Medicines	**100**	**4**		**I**	1T1	Paper I	Indian System of Medicines	**80+ 20**	**4**
02	**I**	T II	Paper II	Systematics of Plants	**100**	**4**		**I**	1T2	Paper II	Systematics of Plants	**80+20**	**4**
03	**I**	T III	Paper III	Cell & Molecular Biology	**100**	**4**		**I**	1T3	Paper III	Cell & Molecular Biology	**80+20**	**4**
04	**I**	T IV	Paper IV	Modern Analytical Techniques	**100**	**4**		**I**	1T4	Paper IV	Modern Analytical Techniques	**80+20**	**4**
05	**I**	P I	Practical -I		**80+ 20**	**4**		**I**	1P1	Practical-I		**100**	**4**
06	**I**	P II	Practical -II		**80+20**	**4**		**I**	1P2	Practical-II		**100**	**4**
07	**I**	Seminar I	Seminar -I		**25**	**1**		**I**	1S1	Seminar-I		**25**	**1**
	M.Sc. Medicinal Plants CBS Pattern: Semester II							**M.Sc. Medicinal Plants Choice Based Credit System (CBCS)**					
01	**II**	T V	Paper V	Fundamentals of Pharmacognosy	**100**	**4**		**II**	2T1	Paper V	Fundamentals of Pharmacognosy	**80+20**	**4**
02	**II**	T VI	Paper VI	Plant Biochemicstry	**100**	**4**		**II**	2T2	Paper VI	Plant Biochemistry	**80+20**	**4**
03	**II**	T VII	Paper VII	Plant Metabolism and Development	**100**	**4**		**II**	2T3	Paper VII	Plant Metabolism and Development	**80+20**	**4**
04	**II**	T VIII	Paper VIII	Natural Plant Products and Phytochemistry-I	**100**	**4**		**III**	3T3 Core elective-	Paper XI	Natural Plant Products and Phytochemistry-I	**80+20**	**4**

									1				
05	**II**	P III	Practical-III		**80+20**	**4**		**II**	2P1	Practical-III		**100**	**4**
06	**II**	P IV	Practical-IV		**80+20**	**4**		**II**	2P2	Practical-IV		**100**	**4**
07	**II**	Seminar-II	Seminar-II		**25**	**1**		**II**	2S1	Seminar-II		**25**	**1**
	M.Sc. Subject: Medicinal Plants …. CBS Pattern: Semester						**M.Sc. Subject: Medicinal Plants …. Choice Based Credit System(CBCS) Semester**						
01	**III**	T IX	Paper IX	Natural Plant Products and Phytochemistry-II	**100**	**4**		**IV**	4T3 Core elective-2	Paper XV	Natural Plant Products and Phytochemistry-II	**80+20**	**4**
02	**III**	T X	Paper X	Medicinal Plant Biotechnology	**100**	**4**		**II**	2T4	Paper VIII	Medicinal Plant Biotechnology	**80+20**	**4**
03	**III**	T XI	Paper XI	Fermentation Technology	**100**	**4**		**III**	3T4 Foundation-I	Paper XII	Fermentation Technology	**80+20**	**4**
04	**III**	T XII	Paper XII	Immunology and Microbiology	**100**	**4**		**III**	3T1	Paper IX	Immunology and Microbiology	**80+20**	**4**
05	**III**	P V	Practical V		**80+20**	**4**		**III**	3P1	Practical V		**100**	**4**
06	**III**	P VI	Practical VI		**80+20**	**4**		**III**	3P2	Practical VI		**100**	**4**
07	**III**	Seminar-III	Seminar-III		**25**	**1**		**III**	3S1	Seminar-III	------	**25**	**1**
	M.Sc. Medicinal Plants. CBS Pattern: Semester						**M.Sc. Subject: Medicinal Plants Choice Based Credit System (CBCS)**						
01	**IV**	T XIII	Paper XIII	Herbal Cosmetics	**100**	**4**		**III**	3T2	Paper X	Herbal Cosmetics	**80+20**	**4**
02	**IV**	T XIV	Paper XIV	Herbal Drug Technology & Development	**100**	**4**		**IV**	4T1	Paper XIII	Herbal Drug Technology & Development	**80+20**	**4**
03	**IV**	T XV	Paper XV	Drug Standardization and Regulations	**100**	**4**		**IV**	4T2	Paper XIV	Drug Standardization and Regulations	**80+20**	**4**

04	**IV**	T XVI	Paper XVI	Project	**100**	**4**		**IV**	4T4 Foundation -2	Paper XVI	Ethnobotany	**80+20**	**4**
05		P VII	Practical VII		**80+20**	**4**		IV	3P2	Practical VII		**100**	**4**
06		P VIII	PVIII		**80+20**	**4**		IV	4PROJ1	Project		**100**	**4**
07		Seminar IV	Seminar IV						4S1	Seminar-IV		**25**	**1**

ANNEXURE M. Sc. Environmental Science

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 3 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Subject Environmental Science CBS Pattern : Semester -I							**M.Sc. Environmental Science Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Environmental Chemistry	100	4		I	1T1	Paper I	Environmental Chemistry	80+ 20	4
02		Paper II	Atmospheric Science	100	4		I	1T2	Paper II	Atmospheric Science	80+20	4
03		Paper III	Environmental Biology	100	4		I	1T3	Paper III	Environmental Biology	80+20	4
04		Paper IV	Environmental Microbiology and Biotechnology	100	4		I	1T4	Paper IV	Environmental Microbiology and Biotechnology	80+20	4
05		Practical-I	Environmental Chemistry and Atmospheric Science	80+ 20	4		I	1P1	Practical-I	Environmental Chemistry and Atmospheric Science	100	4
06		Practical-II	Environmental Biology, Environmental Microbiology and Biotechnology	80+20	4		I	1P2	Practical-II	Environmental Biology, Environmental Microbiology and Biotechnology	100	4
07		Seminar-I		25	1			1S1		Seminar-I	25	1
M.Sc. Subject: Environmental Science CBS Pattern : Semester -II							**M.Sc. Environmental Science Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper V	Environmental Ecosystem and Biodiversity	100	4		II	2T1	Paper V	Environmental Ecosystem and Biodiversity	80+20	4
02		Paper VI	Natural Resources Management	100	4		II	2T2	Paper VI	Natural Resources Management	80+20	4
03		Paper VII	Environmental Sampling and Research Methodology	100	4		II	2T3	Paper VII	Environmental Sampling and Research Methodology	80+20	4

04		Paper VIII	Analytical Techniques for Environmental Monitoring	100	4		II	2T4	Paper VIII	Analytical Techniques for Environmental Monitoring	80+20	4
05		Practical-III	Environmental Ecosystem and Management & Natural Resources management	80+20	4		II	2P1	Practical-III	Environmental Ecosystem and Management & Natural Resources management	100	4
06		Practical-IV	Industrial chemistry & Analytical techniques	80+20	4		II	2P2	Practical-IV	Industrial chemistry & Analytical techniques	100	4
07		Seminar-II		25	1		II	2S1		Seminar-II	25	1
M.Sc. Subject: Environmental Science CBS Pattern : Semester -III						**M.Sc. Environmental Science Choice Based Credit System (CBCS)**						
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper IX	Water Supply and Resources	100	4		III	3T3	Paper XII	(ELECTIVE-II) Water Supply and Resources	80+20	4
02		Paper X	Water and Water Treatment	100	4		III	3T3	Paper XI	(ELECTIVE-I) Water and Water Treatment	80+20	4
03		Paper XI	Physico- Chemical Treatment of Water & Waste Water	100	4		III	3T1	Paper IX	Physico- Chemical Treatment of Water & Waste Water	80+20	4
04		Paper XII	Biological process in waste water Treatment	100	4		III	3T2	Paper X	Biological process in waste water Treatment	80+20	4
06		Practical V	Water & Water Treatment Water Supply and Resources	80+20	4		III	3P2	Practical V	A) (ELECTIVE-I) Water & Water Treatment OR B) (ELECTIVE-II) Water Supply and Resources	100	4
07		Practical VI	Biological process in waste water Treatment	80+20	4		III	3P1	Practical VI	Physico-chemical treatment of water and waste water AND Biological process in waste water Treatment	100	4
08		Seminar-III		25	1		III	3S1		Seminar-III	25	1

M.Sc. Subject Environmental Science CBS Pattern : Semester -IV						Equivalence To	M.Sc. Environmental Science Choice Based Credit System (CBCS)					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**		**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper XIII	Air and Noise Pollution Control Technology	100	4		IV	4T1	Paper XV	Air and Noise Pollution Control Technology	80+20	4
02		Paper XIV	Solid and Hazardous Waste Management	100	4		IV	4T2	Paper XVI	Solid and Hazardous Waste Management	80+20	4
03		Paper XV	Environmental Impact Assessment and Legislation	100	4		IV	4T3	Paper XVII	(ELECTIVE-I) Environmental Impact Assessment and Legislation	80+20	4
04		Paper XVI	Environmental Management	100	4		IV	4T3	Paper XVIII	(ELECTIVE-II) Environmental Management	80+20	4
05		Practical VII	Air and Noise Pollution Control Technologies AND Solid and Hazardous Waste Management	80+20	4		IV	4P1	Practical VII	Air and Noise Pollution Control Technologies AND Solid and Hazardous Waste Management AND EIA & Legislation	100	4
05		Practical VIII	EIA & Legislation & Environmental Management	80+20	4		IV	4P1	Practical VII	Air and Noise Pollution Control Technologies AND Solid and Hazardous Waste Management AND EIA & Legislation	100	4
06		Project		80+20	4		IV	4PR OJ1		Project	100	4
07			Seminar IV	25	1			4S1		Seminar-IV	25	1

ANNEXURE M. Sc. Computer Science

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Computer Science CBS Pattern : Semester -I							**M.Sc. Computer Science Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	Paper 1	Paper I	Discrete Mathematical Structure	**100**	**4**		**I**	**1T1**	Paper I	Discrete Mathematical Structure	**80+ 20**	**4**
02	Paper 2	Paper II	Programming in Java	**100**	**4**		**I**	**1T2**	Paper II	Programming in Java	**80+20**	**4**
03	Paper 3	Paper III	Digital Electronics and Microprocessor	**100**	**4**		**I**	**1T3**	Paper III	Digital Electronics and Microprocessor	**80+20**	**4**
04	Paper 4	Paper IV	Advanced DBMS and Administration	**100**	**4**		**I**	**1T4**	Paper IV	Advanced DBMS and Administration	**80+20**	**4**
05	Practical-I	Practical-I	Practical-I based on theory paper-1 and 2	**80+ 20**	**4**		**I**	**1P1**	Practical-I	Practical-I based on theory paper-1 and 2	**100**	**4**
06	Practical-II	Practical-II	Practical-II based on theory paper-3 and 4	**80+20**	**4**		**I**	**1P2**	Practical-II	Practical-II based on theory paper-3 and 4	**100**	**4**
07		Seminar-I	Seminar	**25**	**1**		**I**		Seminar-I	Seminar I	**25**	**1**
M.Sc. Computer Science CBS Pattern : Semester -II							**M.Sc. Computer Science Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	Paper 1	Paper V	Windows Programming using VC++	**100**	**4**		**II**	**2T1**	Paper 5	Windows Programming using VC++	**80+20**	4
02	Paper 2	Paper VI	Theory of Computation and Compiler	**100**	**4**		**II**	**2T2**	Paper 6	Theory of Computation and Compiler Construction	**80+20**	**4**

			Construction		
03	Paper 3	Paper VII	Computer Architecture and Organization	**100**	**4**
04	Paper 4	Paper VIII	Computer Graphics	**100**	**4**
05	Practical-I	Practical-III	Practical-I based on theory paper-1 and 2	**80+20**	**4**
06	Practical-II	Practical-IV	Practical-II based on theory paper-3 and 4	**80+20**	**4**
07		Seminar-II	Seminar	**25**	**1**

M.Sc. Computer Science CBS Pattern : Semester -III

S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	Paper 1	Paper IX	Data Communication and Networks	**100**	**4**
02	Paper 2	Paper X	Software Engineering	**100**	**4**
03	Paper 3	Paper XI	Neural Network	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.1 Mobile Computing	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.2 Multimedia Technologies	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.3 ASP.NET	**100**	**4**
05	Practical-I	Practical V	Practical-I based on theory paper-1and 2	**80+20**	**4**

Equivalence To

II	**2T3**	Paper 7	Computer Architecture and Organization	**80+20**	**4**
II	**2T4**	Paper 8	Computer Graphics	**80+20**	**4**
II	**2P1**	Practical 3	Practical 3 based on theory paper-5 and 6	**100**	**4**
II	**2P2**	Practical 4	Practical 4 based on theory paper-7 and 8	**100**	**4**
II		Seminar 2	Seminar 2	**25**	**1**

M.Sc. Computer Science Choice Based Credit System (CBCS)

Sem	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
III	**3T1**	Paper 9	Data Communication and Networks	**80+20**	**4**
III	**3T2**	Paper 10	Software Engineering	**80+20**	**4**
III	**3T3**	Paper 11	Core Elective 1 CE1-1 Neural Network	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 Mobile Computing	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 Mobile Computing	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 Mobile Computing	**80+20**	**4**
III	**3P1**	Practical 5	Practical 5 based on theory paper-9	**100**	**4**

										and 10		
06	Practical-II	Practical VI	Practical-II based on theory paper-3 and 4	**80+20**	**4**		**III**	**3P2**	Practical 6	Practical 6 based on paper 11	**100**	**4**
07		Seminar-III	Seminar	**25**	**1**		**III**		Seminar 3	Seminar 3	**25**	**1**

M.Sc. Computer Science CBS Pattern : Semester -IV							**M.Sc. Computer Science Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	Paper 1	Paper XIII	Data Mining	**100**	**4**		**IV**	**4T1**	Paper 13	Data Mining	**80+20**	**4**
02	Paper 2	Paper XIV	Artificial Intelligence & Expert System	**100**	**4**		**IV**	**4T2**	Paper 14	Artificial Intelligence & Expert System	**80+20**	**4**
03	Paper 3	Paper XV	Design and Analysis of Algorithm	**100**	**4**		**IV**	**4T3**	Paper 15	Core Elective 2 CE2-1 Design and Analysis of Algorithm	**80+20**	**4**
04	Paper 4	Paper XVI	Elective-2 2.1 Embedded System	**100**	**4**		**IV**	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Parallel Computing	**80+20**	**4**
04	Paper 4	Paper XVI	Elective-2 2.2 Pattern Recognition	**100**	**4**		**IV**	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Parallel Computing	**80+20**	**4**
04	Paper 4	Paper XVI	Elective-2 2.3 Parallel Computing	**100**	**4**		**IV**	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Parallel Computing	**80+20**	**4**
05	Practical-I	Practical VII	Practical-I based on theory paper-1 to 4	**80+20**	**4**		**IV**	**4P1**	Practical 7	Practical 7 based on theory paper-13,14,15	**100**	**4**
06	Project	Project	Project	**80+20**	**4**		**IV**	4PROJ1	Project	Project	**100**	**4**
07			Seminar				**IV**		Seminar 4	Seminar 4	**25**	**1**

ANNEXURE M. Sc. Information Technology

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Information Technology CBS Pattern : Semester -I							**M.Sc. Information Technology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	Paper 1	Paper I	Computer Architecture and Organization	**100**	**4**		**I**	**1T1**	Paper I	Computer Architecture and Organization	**80+ 20**	**4**
02	Paper 2	Paper II	Internet Computing With ASP.NET	**100**	**4**		**I**	**1T2**	Paper II	Internet Computing With ASP.NET	**80+20**	**4**
03	Paper 3	Paper III	Distributed Operating System	**100**	**4**		**I**	**1T3**	Paper III	Distributed Operating System	**80+20**	**4**
04	Paper 4	Paper IV	Advanced DBMS and Administration	**100**	**4**		**I**	**1T4**	Paper IV	Advanced DBMS and Administration	**80+20**	**4**
05	Practical-I	Practical-I	Practical-I based on theory paper-1 and 2	**80+ 20**	**4**		**I**	**1P1**	Practical-I	Practical-I based on theory paper-1 and 2	**100**	**4**
06	Practical-II	Practical-II	Practical-II based on theory paper-3 and 4	**80+20**	**4**		**I**	**1P2**	Practical-II	Practical-II based on theory paper-3 and 4	**100**	**4**
07		Seminar-I	Seminar	**25**	**1**		**I**		Seminar-I	Seminar I	**25**	**1**
M.Sc. Information Technology CBS Pattern : Semester -II							**M.Sc. Information Technology Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**

01	Paper 1	Paper V	Windows Programming using VC++	**100**	**4**
02	Paper 2	Paper VI	Theory of Computation and Compiler Construction	**100**	**4**
03	Paper 3	Paper VII	Network Programming	**100**	**4**
04	Paper 4	Paper VIII	Open source Web Programming using PHP	**100**	**4**
05	Practical-I	Practical-III	Practical-I based on theory paper-1 and 2	**80+20**	**4**
06	Practical-II	Practical-IV	Practical-II based on theory paper-3 and 4	**80+20**	**4**
07		Seminar-II	Seminar	**25**	**1**

M.Sc. Information Technology CBS Pattern : Semester -III

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	Paper 1	Paper IX	Data Communication and Networks	**100**	**4**
02	Paper 2	Paper X	Software Engineering	**100**	**4**
03	Paper 3	Paper XI	Soft Computing	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.1 Distributed Databases	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.2 Object Oriented Analysis and Design using UML	**100**	**4**
04	Paper 4	Paper XII	Elective-1 1.3 CORBA	**100**	**4**
05	Practical-I	Practical V	Practical-I based on theory paper-1and 2	**80+20**	**4**

II	**2T1**	Paper 5	Windows Programming using VC++	**80+20**	4
II	**2T2**	Paper 6	Theory of Computation and Compiler Construction	**80+20**	**4**
II	**2T3**	Paper 7	Network Programming	**80+20**	**4**
II	**2T4**	Paper 8	Open source Web Programming using PHP	**80+20**	**4**
II	**2P1**	Practical 3	Practical 3 based on theory paper-5 and 6	**100**	**4**
II	**2P2**	Practical 4	Practical 4 based on theory paper-7 and 8	**100**	**4**
II		Seminar 2	Seminar 2	**25**	**1**

M.Sc. Information Technology Choice Based Credit System (CBCS)

Equivalence To

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
III	**3T1**	Paper 9	Data Communication and Networks	**80+20**	**4**
III	**3T2**	Paper 10	Software Engineering	**80+20**	**4**
III	**3T3**	Paper 11	Core Elective 1 CE1-1 Soft Computing	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 CORBA	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 CORBA	**80+20**	**4**
III	**3T4**	Paper 12	Core(Discipline Centric)1 CDC1 CORBA	**80+20**	**4**
III	**3P1**	Practical 5	Practical 5 based on theory paper-9	**100**	**4**

06	Practical-II	Practical VI	Practical-II based on theory paper-3 and 4	**80+20**	**4**
07		Seminar-III	Seminar	**25**	**1**

M.Sc. Information Technology CBS Pattern : Semester -IV

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	Paper 1	Paper XIII	Data Warehousing And Data Mining	**100**	**4**
02	Paper 2	Paper XIV	Artificial Intelligence & Expert System	**100**	**4**
03	Paper 3	Paper XV	Design and Analysis of Algorithm	**100**	**4**
04	Paper 4	Paper XVI	Elective-2 2.1 Cloud Computing	**100**	**4**
04	Paper 4	Paper XVI	Elective-2 2.2 Mobile Computing	**100**	**4**
04	Paper 4	Paper XVI	Elective-2 2.3 Enterprise Computing	**100**	**4**
05	Practical-I	Practical VII	Practical-I based on theory paper-1 to 4	**80+20**	**4**
06	Project	Project	Project	**80+20**	**4**
07			Seminar		

Equivalence To

			and 10		
III	**3P2**	Practical 6	Practical 6 based on paper 11	**100**	**4**
III		Seminar 3	Seminar 3	**25**	**1**

M.Sc. Information Technology Choice Based Credit System (CBCS)

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
IV	**4T1**	Paper 13	Data Warehousing And Data Mining	**80+20**	**4**
IV	**4T2**	Paper 14	Artificial Intelligence & Expert System	**80+20**	**4**
IV	**4T3**	Paper 15	Core Elective 2 CE2-1 Design and Analysis of Algorithm	**80+20**	**4**
IV	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Enterprise Computing	**80+20**	**4**
IV	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Enterprise Computing	**80+20**	**4**
IV	**4T4**	Paper 16	Core(Discipline Centric)2 CDC2 Enterprise Computing	**80+20**	**4**
IV	**4P1**	Practical 7	Practical 7 based on theory paper-13,14,15	**100**	**4**
IV	4PROJ1	Project	Project	**100**	**4**
IV		Seminar 4	Seminar 4	**25**	**1**

ANNEXURE M. Sc. Physics

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Physics CBS Pattern : Semester -I							**M.Sc. Physics Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper I	Mathematical Physics	100	4		I	1T1	1	Mathematical Physics	80+ 20	4
02		Paper II	Classical Mechanics	100	4		II	2T3	7	Classical Mechanics	80+20	4
03		Paper III	Solid State Physics I	100	4		III	3T2	10	Solid State Physics and Spectroscopy	80+20	4
04		Paper IV	Electrodynamics I	100	4		I	1T4	4	Electrodynamics I	80+20	4
05		Practical-I	Practical I (Sem I)	80+ 20	4		1	1P1		Practical I	100	4
06	:	Practical-II	Practical II (Sem I)	80+20	4		1	1P2		Practical II	100	4
07		Seminar-I	Seminar (Sem I)	25	1		1	1S1		Seminar-I (Sem I)	25	1
M.Sc. Physics: CBS Pattern : Semester -II							**M.Sc. Physics Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper V	Quantum Mechanics I	100	4		2	2T1	5	Quantum Mechanics I	80+20	4
02		Paper VI	Numerical Methods	100	4		1	1T2	2	Complex Analysis and Numerical methods	80+20	4

03		Paper VII	Statistical Physics	100	4		2	2T2	6	Statistical Physics	80+20	4
04		Paper VIII	Electrodynamics II	100	4		2	2T4	8	Electrodynamics II	80+20	4
05		Practical-III	Practical I (Sem II)	80+20	4		2	2P1		Practical 3	100	4
06		Practical-IV	Practical II (Sem II)	80+20	4		2	2P2		Practical 4	100	4
07		Seminar-II	Seminar (Sem II)	25	1		2	2S1		Seminar-II (Sem II)	25	1
M.Sc. Physics: CBS Pattern : Semester -III						**M.Sc. Physics Choice Based Credit System (CBCS)**						
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper IX	Quantum Mechanics II	100	4		3	3T1	9	Quantum Mechanics II	80+20	4
02		Paper X	Nuclear and Particle Physics I	100	4		1	1T3	3	Electronics* (There is no overlap between these two subjects.)	80+20	4
03		Paper XI	Materials Science I	100	4		3	3T3	11	Materials Science I	80+20	4
04		Paper XI	Atomic and Molecular Physics (Spectroscopy I)	100	4		3	3T3	11	Atomic and Molecular Physics I	80+20	4
05		Paper XI	Applied Electronics I	100	4		3	3T3	11	Applied Electronics I	80+20	4
06		Paper XI	X-Rays I	100	4		3	3T3	11	X-Rays I	80+20	4
07		Paper XI	Nanoscience and Nanotechnology I	100	4		3	3T3	11	Nanoscience and Nanotechnology I	80+20	4
08		Paper XII	X-rays	100	4		3	3T4	12 S1.2	Nanoscience and Nanotechnology	80+20	4
09		Paper XII	Materials Science	100	4		3	3T4	12 S1.2	Nanoscience and Nanotechnology	80+20	4

10		Paper XII	Numerical Methods and Programming	100	4		3	3T4	12 S1.2	Nanoscience and Nanotechnology	80+20	4
11		Paper XII	Spectroscopy Elective I	100	4		3	3T4	12 S1.2	Nanoscience and Nanotechnology	80+20	4
12		Paper XII	Lasers, Fibre Optics and Applications Elective I	100	4		3	3T4	12 S1.2	Nanoscience and Nanotechnology	80+20	4
13		Paper XII	Digital Electronics and Microprocessors	100	4		3	3T4	12 S1.4	Digital Electronics and Microprocessors	80+20	4
14		Practical V	Practical 1 (Sem III)	80+20	4		3	3P1		Practical 5	100	4
15		Practical VI	Practical II (Sem III)	80+20	4		3	3P2		Practical 6	100	4
16		Seminar-III	Seminar (Sem III)	25	1		3	3S1		Seminar-III (Sem III)	25	1
M.Sc. Physics CBS Pattern : Semester -IV						**M.Sc. Physics Choice Based Credit System (CBCS)**						
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01		Paper XIII	Solid State Physics II	100	4		4	4T2	14	Solid State Physics	80+20	4
02		Paper XIV	Nuclear And Particle Physics II	100	4		4	4T1	13	Nuclear and Particle Physics	80+20	4
03		Paper XV	Materials Science II	100	4		4	4T3	15	Materials Science II	80+20	4
04		Paper XV	Atomic and Molecular Physics (Spectroscopy II)	100	4		4	4T3	15	Atomic and Molecular Physics II	80+20	4
05		Paper XV	Applied Electronics II	100	4		4	4T3	15	Applied Electronics II	80+20	4
06		Paper XV	X-rays II	100	4		4	4T3	15	X-Rays II	80+20	4
07		Paper XV	Nanoscience and Nanotechnology II	100	4		4	4T3	15	Nanoscience and Nanotechnology II	80+20	4

08		Paper XVI	Nanoscience	100	4		4	4T4	16 S2.2	Experimental Techniques in Physics	80+20	4
09		Paper XVI	Nonlinear Dynamics with applications to Physics and other sciences	100	4		4	4T4	16 S2.2	Experimental Techniques in Physics	80+20	4
10		Paper XVI	Condensed Matter Physics	100	4		4	4T4	16 S2.2	Experimental Techniques in Physics	80+20	4
11		Paper XVI	Electroacoustics	100	4		4	4T4	16 S2.4	Electroacoustics	80+20	4
12		Paper XVI	Spectroscopy Elective II	100	4		4	4T4	16 S2.4	Experimental Techniques in Physics	80+20	4
13		Paper XVI	Lasers, Fibre optics and Applications elective II	100	4		4	4T4	16 S2.4	Experimental Techniques in Physics	80+20	4
14		Practical VII	Practical I(Sem IV)	80+20	4		4	4P1		Practical 7 (Sem IV)	100	4
15		Project	Project	80+20	4		4	4PROJ1		Project	100	4
16		Seminar IV	Seminar (Sem IV)	25			4	4S1		Seminar-IV (Sem IV)	25	1

ANNEXURE M. Sc. ZOOLOGY

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M.Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

	If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**				
	M.Sc. Zoology CBS Pattern : Semester -I							**M.Sc. Zoology Choice Based Credit System (CBCS) Semester -I**				
S. No.	**Semester**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**		**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem-I		Paper -I	Structure and function of Invertebrates	100	4	Equivalent	$1T_1$	Paper -I	Structure and function of Invertebrates	80+ 20	4
02	Sem-I		Paper- II	General Physiology	100	4		$1T_2$	Paper- II	General Physiology	80+20	4
03	Sem-I		Paper- III	Cell Biology and Genetics	100	4		$1T_3$	Paper –III	Cell Biology and Genetics	80+20	4
04	Sem-I		Paper- IV	Advance Reproductive Biology	100	4		$1T_4$	Paper- IV	Advance Reproductive Biology	80+20	4
05	Sem-I		Practical-I	Structure and Function of Invertebrates and General Physiology	80+ 20	4		$1P_1$	Practical –I	Structure and Function of Invertebrates and General Physiology	100	4
06	Sem-I		Practical-II	Cell Biology, Genetics and Advance Reproductive Biology	80+20	4		$1P_2$	Practical -II	Cell Biology, Genetics and Advance Reproductive Biology	100	4
07	Sem-I		Seminar-I		25	1		$1S_1$			25	1
	M.Sc. Zoology CBS Pattern : Semester -II							**M.Sc. Zoology Choice Based Credit System (CBCS) Semester -II**				
S. No.	**Semester**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**		**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem-II		Paper –V	Structure and Function of Vertebrate	100	4	Equivalent	$2T_1$	Paper- V	Structure and Function of Vertebrates	80+20	4
02	Sem-II		Paper -VI	Comparative Endocrinology	100	4		$2T_2$	Paper-VI	Comparative Endocrinology	80+20	4
03	Sem-II		Paper- VII	Molecular Biology and Biotechnology	100	4		$2T_3$	Paper-VII	Molecular Biology and Biotechnology	80+20	4
04	Sem-II		Paper- VIII	Advance Developmental Biology	100	4		$2T_4$	Paper -VIII	Advance Developmental Biology	80+20	4
05	Sem-II		Practical-III	Structure and Function of Vertebrates and Comparative Endocrinology	80+20	4		$2P_1$	Practical- III	Structure and Function of Vertebrates and Comparative Endocrinology	100	4
06	Sem-II		Practical-	Molecular Biology,	80+20	4		$2P_2$		Molecular Biology,	100	4

			IV	Biotechnology and Developmental Biology						Biotechnology and Developmental Biology		
07	Sem-II		Seminar-II		25	1		$2S_2$			25	1
	M.Sc. Zoology CBS Pattern: Semester -III							**M.Sc. Zoology Choice Based Credit System (CBCS) Semester -III**				
S. No.	**Semester**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**		**Code No.**	**Paper**	**Subject**	**Total Marks**	**Credits**
01	Sem-III		Paper -IX	Parasitology	100	4		$3T_1$	Paper –IX	Parasitology and Immunology	80+20	4
02	Sem-III		Paper -IX	Immunology	100	4		$3T_1$	Paper –IX	Wild Life and Avian Biology	80+20	4
03	Sem-III		Paper -X	Entomology-I	100	4		$3T_2$	Paper-X	Entomology-I	80+20	4
	Sem-III		Paper- X	Fish and fisheries-I	100	4		$3T_2$	Paper-X	Fish and fisheries-I	80+20	4
	Sem-III		Paper -X	Mammalian Reproductive Physiology-I	100	4		$3T_2$	Paper-X	Mammalian Reproductive Physiology-I	80+20	4
	Sem-III		Paper -X	Animal Physiology-I	100	4		$3T_2$	Paper-X	Animal Physiology-I	80+20	4
	Sem-III		Paper- X	Cell Biology-I	100	4		$3T_2$	Paper-X	Cell Biology-I	80+20	4
	Sem-III		Paper- X	Freshwater Zoology-I	100	4		$3T_2$	Paper-X	Freshwater Zoology-I	80+20	4
	Sem-III		Paper -X	Aquaculture-I	100	4		$3T_2$	Paper-X	Aquaculture-I	80+20	4
	Sem-III		Paper -X	Environmental Biology-I	100	4		$3T_2$	Paper-X	Environmental Biology-I	80+20	4
	Sem-III		Paper- X	Sericulture-I	100	4		$3T_2$	Paper-X	Sericulture-I	80+20	4
04	Sem-III		Paper -XI	Entomology-II	100	4		$3T_3$	Paper-XI	Entomology-II	80+20	4
	Sem-III		Paper-XI	Fish and fisheries-II	100	4		$3T_3$	Paper-XI	Fish and fisheries-II	80+20	4
	Sem-III		Paper-XI	Mammalian Reproductive Physiology-II	100	4		$3T_3$	Paper-XI	Mammalian Reproductive Physiology-II	80+20	4
	Sem-III		Paper-XI	Animal Physiology-II	100	4		$3T_3$	Paper-XI	Animal Physiology-II	80+20	4
	Sem-III		Paper-XI	Cell Biology-II	100	4		$3T_3$	Paper-XI	Cell Biology-II	80+20	4
	Sem-III		Paper-XI	Freshwater Zoology-II	100	4		$3T_3$	Paper-XI	Freshwater Zoology-II	80+20	4
	Sem-III		Paper-XI	Aquaculture-II	100	4		$3T_3$	Paper-XI	Aquaculture-II	80+20	4
	Sem-III		Paper-XI	Environmental Biology-II	100	4		$3T_3$	Paper-XI	Environmental Biology-II	80+20	4
	Sem-III		Paper-XI	Sericulture-II	100	4		$3T_3$	Paper-XI	Sericulture-II	80+20	4
05	Sem-III		Practical-V	Parasitology and Immunology	80+20	4		$3P_1$		Parasitology and Immunology	100	4
06	Sem-III		Practical-VI	Practical of all the specializations	80+20	4		$3P_2$		Practical of all the specializations	100	4
07	Sem-III		Seminar-III		25	1		$3S_3$	Seminar-III		25	1
	M.Sc. Zoology CBS Pattern : Semester –IV							**M.Sc. Zoology Choice Based Credit System (CBCS) Semester –IV**				
S. No.	**Semester**	**Code**	**Paper**	**Name of Paper**	**Total**	**Cre**	Equivalent	**Code**	**Paper**	**Subject**	**Total**	**Credit**

	r	No.			Marks	dits		No.			Marks	s
01	Sem-IV		Paper- XIII	Biotechniques, Biostatistics, Ethology, Toxicology	100	4		$4T_1$	Paper -XIII	Biotechniques, Biostatistics, Ethology, Toxicology and Bioinformatics	80+20	4
02	Sem-IV		Paper- XIII	Bioinformatics	100	4		$4T_1$	Paper -XIII	Radiation and Chronobiology	80+20	4
03	Sem-IV		Paper- XIV	Entomology-I	100	4		$4T_2$	Paper-XIV	Entomology-I	80+20	4
	Sem-IV		Paper -XIV	Fish and fisheries-I	100	4		$4T_2$	Paper- XIV	Fish and fisheries-I	80+20	4
	Sem-IV		Paper -XIV	Mammalian Reproductive Physiology-I	100	4		$4T_2$	Paper- XIV	Mammalian Reproductive Physiology-I	80+20	4
	Sem-IV		Paper -XIV	Animal Physiology-I	100	4		$4T_2$	Paper- XIV	Animal Physiology-I	80+20	4
	Sem-IV		Paper -XIV	Cell Biology-I	100	4		$4T_2$	Paper- XIV	Cell Biology-I	80+20	4
	Sem-IV		Paper- XIV	Freshwater Zoology-I	100	4		$4T_2$	Paper -XIV	Freshwater Zoology-I	80+20	4
	Sem-IV		Paper -XIV	Aquaculture-I	100	4		$4T_2$	Paper- XIV	Aquaculture-I	80+20	4
	Sem-IV		Paper- XIV	Environmental Biology-I	100	4		$4T_2$	Paper- XIV	Environmental Biology-I	80+20	4
	Sem-IV		Paper -XIV	Sericulture-I	100	4		$4T_2$	Paper- XIV	Sericulture-I	80+20	4
04	Sem-IV		Paper-XV	Entomology-II	100	4		$4T_3$	Paper-XV	Entomology-II	80+20	4
	Sem-IV		Paper-XV	Fish and fisheries-II	100	4		$4T_3$	Paper-XV	Fish and fisheries-II	80+20	4
	Sem-IV		Paper-XV	Mammalian Reproductive Physiology-II	100	4		$4T_3$	Paper-XV	Mammalian Reproductive Physiology-II	80+20	4
	Sem-IV		Paper-XV	Animal Physiology-II	100	4		$4T_3$	Paper-XV	Animal Physiology-II	80+20	4
	Sem-IV		Paper-XV	Cell Biology-II	100	4		$4T_3$	Paper-XV	Cell Biology-II	80+20	4
	Sem-IV		Paper-XV	Freshwater Zoology-II	100	4		$4T_3$	Paper-XV	Freshwater Zoology-II	80+20	4
	Sem-IV		Paper-XV	Aquaculture-II	100	4		$4T_3$	Paper-XV	Aquaculture-II	80+20	4
	Sem-IV		Paper-XV	Environmental Biology-II	100	4		$4T_3$	Paper-XV	Environmental Biology-II	80+20	4
	Sem-IV		Paper-XV	Sericulture-II	100	4		$4T_3$	Paper-XV	Sericulture-II	80+20	4
05	Sem-IV		Practical-VII	Practicals of all specializations	80+20	4		$4P_1$	Practical – VII	Practicals of all specializations	100	4
06	Sem-IV		Project	Project Work (Equivalent)	80+20	4		4PROJ1	Project work	Project	100	4
07	Sem-IV		Seminar-IV		25	1		$4S_4$	Seminar- IV		25	1

Head
Dr. Mrs. M.S. Sastry

ANNEXURE M. Sc. Electronics

Equivalence of Syllabus / papers between CBS & CBCS syllabus for desirous students (CBS Pattern students (introduced in the Year 2012-2013) in CBCS Pattern (introduced in the year 2015-16 at M. Sc Semester I and II and in the year 2016-17, at M.Sc. Semester –III and Semester IV

If the candidate has failed in any of the papers mentioned below (As described in Point no. 22 'b', 'c', 'd', and 'e')							**Then, the candidate shall appear and clear the paper shown in the respective row as equivalent paper**					
M.Sc. Electronics: CBS Pattern : Semester -I							**M.Sc. Electronics : Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	ELE 101	Paper I	Fundamentals of Semiconductor Devices	**100**	**4**		**I**	1T1	Paper I	Fundamentals of Semiconductor Devices	**80+ 20**	**4**
02	ELE 102	Paper II	Digital Design and Applications	**100**	**4**		**I**	1T2	Paper II	Digital Design and Applications	**80+20**	**4**
03	ELE 103	Paper III	Advanced Microprocessors	**100**	**4**		**I**	1T3	Paper III	Advanced Microprocessors	**80+20**	**4**
04	ELE 104	Paper IV	Programming in C	**100**	**4**		**I**	1T4	Paper IV	Programming in C	**80+20**	**4**
05	ELE 1P1	Practical-I	Lab Course I- Analog and Digital Electronics Lab	**80+ 20**	**4**		**I**	1P1	Practical-I	Lab Course I- Analog and Digital Electronics Lab	**100**	**4**
06	ELE 1P2	Practical-II	Lab Course II- Computer Interfacing and Programming in C	**80+20**	**4**		**I**	1P2	Practical-II	Lab Course II- Computer Interfacing and Programming in C	**100**	**4**
07		Seminar-I	Seminar	**25**	**1**		**I**	1S1	Seminar-I	Seminar	**25**	**1**
M.Sc. Electronics : CBS Pattern : Semester -II							**M.Sc. Electronics: Choice Based Credit System (CBCS)**					
S. No.	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**	**Equivalence To**	**Sem**	**Code No.**	**Paper**	**Name of Paper**	**Total Marks**	**Credits**
01	ELE 201	Paper V	Embedded Systems and Applications	**100**	**4**		II	2T1	Paper V	Embedded Systems and Applications	**80+20**	4
02	ELE 202	Paper VI	Biomedical Instrumentation	**100**	**4**		**II**	2T2	Paper VI	Biomedical Instrumentation	**80+20**	**4**
03	ELE 203	Paper VII	Computer Organisation and Interfacing	**100**	**4**		**II**	2T3	Paper VII	Computer Organisation and Interfacing	**80+20**	**4**
04	ELE 204	Paper VIII	Virtual Instrumentation	**100**	**4**		**II**	2T4	Paper VIII	Virtual Instrumentation	**80+20**	**4**

05	ELE 2P1	Practical-III	Lab Course III – Microcontroller and Interfacing	**80+20**	**4**
06	ELE 2P2	Practical-IV	Lab Course IV- Virtual instrumentation and Programming in Lab VIEW	**80+20**	**4**
07		Seminar-II	Seminar	**25**	**1**

II	2P1	Practical-III	Lab Course III – Microcontroller and Interfacing	**100**	**4**
II	2P2	Practical-IV	Lab Course IV- Virtual instrumentation and Programming in Lab VIEW	**100**	**4**
II	2S1	Seminar-II	Seminar	**25**	**1**

M.Sc. Electronics: CBS Pattern : Semester -III

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits
01	ELE 301	Paper IX	Network Analysis and Synthesis	**100**	**4**
02	ELE 302	Paper X	Fuzzy Logic and Artificial Neural Networks	**100**	**4**
03	ELE 303	Paper XI	Digital signal Processing	**100**	**4**
04	ELE 304	Paper XII	Mechatronics	**100**	**4**
06	ELE 3P1	Practical V	Lab Course V- Fuzzy Logic and Artificial Neural Network	**80+20**	**4**
07	ELE 3P2	Practical VI	Lab Course VI- Digital Signal and Mechatronics	**80+20**	**4**
08		Seminar-III	Seminar	**25**	**1**

M.Sc. Electronics: Choice Based Credit System (CBCS)

Equivalence To

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits
III	3T1	Paper IX	Network Analysis and Synthesis	**80+20**	**4**
III	3T2	Paper X	Fuzzy Logic and Artificial Neural Networks	**80+20**	**4**
III	3T3-1	Paper XI	Digital signal Processing	**80+20**	**4**
III	3TSC 1	Paper XII	Mechatronics	**80+20**	**4**
III	3P1	Practical V	Lab Course V- Network Analysis; Fuzzy Logic and Artificial Neural Network using MATLAB	**100**	**4**
III	3P2	Practical VI	Lab Course VI- Digital Signal Processing using MATLAB and Mechatronics/Digital Image Processing	**100**	**4**
	3S1	Seminar-III	Seminar	**25**	**1**

M.Sc. Electronics: CBS Pattern : Semester -IV

S. No.	Code No.	Paper	Name of Paper	Total Marks	Credits

M.Sc. Electronics : Choice Based Credit System (CBCS)

Sem	Code No.	Paper	Name of Paper	Total Marks	Credits

01	ELE 401	Paper XIII	Electromagnetic Fields and Antennas	**100**	**4**	**IV**	4T1	Paper XIII	Electromagnetic Fields and Antennas	**80+20**	**4**
02	ELE 402	Paper XIV	Digital Communication	**100**	**4**	**IV**	4T2	Paper XIV	Digital Communication	**80+20**	**4**
03	ELE 403	Paper XV	Microwave and Optical Communication	**100**	**4**	**IV**	4T3-1	Paper XV	Microwave and Optical Communication	**80+20**	**4**
04	ELE 404	Paper XVI	Mobile and Satellite Communication	**100**	**4**	**IV**	4TSC 2	Paper XVI	Mobile and Satellite Communication	**80+20**	**4**
05	ELE 4P1	Practical VII	Lab Course VII – Communication Lab	**80+20**	**4**	**IV**	4P1	Practic al VII	Lab Course VII – Antenna and Digital Communication Lab; and Microwave & Optical Communication/ Mobile and Satellite Communication	**100**	**4**
06	ELE 4P2	Project	Project and Seminar	**80+20**	**4**	**IV**	4PRO J1	Project	Project and Seminar	**100**	**4**
07			Seminar IV				4S1		**Seminar-IV**	**25**	**1**

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY

DIRECTION NO.25 OF 2017

DIRECTION GOVERNING THE EXAMINATION LEADING TO THE DEGREE OF MASTER OF COMPUTER MANAGEMENT (MCM)

Choice Based Credit System (CBCS)

WHEREAS the Maharashtra Universities Act No. XXXV of 1994 has come into force with effect from 22nd July,1994.

AND

WHEREAS the amendment to the said Act came to be effected from 2016-2017.

AND

WHEREAS the Faculty of Commerce at its meeting held on 14.2.2012 have decided to update and upgrade the existing syllabus for the award of the degree of Master of Computer Management commensurate with the curricula existing in the various Universities in India and with a view to include the latest trends in the commerce stream as well as to design it to suit to the needs of the industries and corporate houses as provided under Section 38(a) of the Act.

AND

WHEREAS the Coordinator of the Faculty of Commerce concurred with the recommendations of the Special Task Committee in Computer Application in the Faculty of Commerce .

AND

WHEREAS the Special Task Committee in Computer Application in its meetings held on 24.2.2016 updated the existing syllabi and recommended some modifications in the scheme of examination for postgraduate courses,

AND

WHEREAS the Coordinator, Faculty of Commerce has consented to the changes in the syllabus and the scheme of examination for the award of Master of Computer Management Degree,

AND

WHEREAS the Vice-Chancellor, Nagpur University, Nagpur approved the recommendations so made by the Special Task Committee in the Faculty of Commerce

duly concurred by the Coordinator, Faculty of Commerce as required under Section 38 (a) of the Act .

AND

WHEREAS it is expedient to provide and Ordinance for the purpose of prescribing examinations leading to the degree of Master of Computer Management in the Faculty of Commerce and phasic repeal of Ordinance No. 21 of 1994 governing the existing course of Master of Computer Management.

AND

WHEREAS As per the Advice of the Vice Chancellor, Coordinator, Faculty of Commerce & Coordinator, Special Task Committee (Computer Application) in the meeting held on 4.1.2016 constituted sub-committee for syllabus restructuring of MCM with Semester pattern.

AND

Whereas, The Sub-committee submitted the Semester Draft Syllabus of MCM in meeting held on 24.2.2016;

AND

Whereas, the Sub-committee submitted the Semester Draft Syllabus of BCCA in meeting held on 5.4.2016.

AND

Whereas, the University has issued Direction to 15 of 2017 dealing with the composition of the four faculties created by the Act, where under the existing different faculties of the University have been merged into the four new faculties created by the Act, by which the erstwhile independent faculty of "Law" has been merged in the new faculty of "Humanities" under the Act;

AND

Whereas, the University has issued Direction No. 13 of 2017 prescribing "conditions for conduct of undergraduate and post graduate examinations based on credit based/choice based credit system, in all faculties, Direction, 2017" on 06/06/2017, prescribing certain conditions relating to maximum and minimum passing marks in the theory /practical subjects prescribed in the semester of a course, the maximum theory and practical subjects in a semester, rules of exemption and ATKT, and also the coding pattern for the subjects in each semester of the course, necessitating appropriate changes in the existing Directions governing the undergraduate and post graduation courses in all the faculties of the University;

AND

WHEREAS it is expedient to provide an Ordinance for the purpose of prescribing examinations leading to the degree of Bachelor of Commerce (B.Com. (Computer Application))(BCCA) in the Faculty of Commerce and phasic repeal of Ordinance No. 21 of 1994 governing the existing course of Bachelor of Commerce (B.Com. (Computer Application))(BCCA) but the Ordinance making is a consuming process and there is an exigency necessitating exercise of powers by the Vice-Chancellor under section 12(8) of the Act;

Now, therefore, I, Dr. S. P. Kane, Vice-Chancellor, RashtrasantTukadojiMaharaj Nagpur University, Nagpur in exercise of the powers vested in me under Section 14(8) of the Maharashtra University Act of 1994 do hereby issue the following direction:

This direction shall be called **"DIRECTION REGARDING EXAMINATIONS LEADING TO THE MASTER OF COMPUTER MANAGEMENT IN THE FACULTY OF COMMERCE, RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR".**

1. There shall be FOUR examinations leading to the degree of Master of Computer Management namely:

   Part-I

   (1) The Master of Computer Management (MCM) Semester - I Examination,

   (2) The Master of Computer Management (MCM) Semester - II Examination,

   Part-II

   (3) The Master of Computer Management (MCM) Semester - III Examination,

   (4) The Master of Computer Management (MCM) Semester - IV Examination,

2. The duration of the Degree Course under this shall be of two academic years. The MCM Semester - I Examination at the end of the first Semester and MCM Semester - II Examination at the end of the Second Semester in First Year and MCM Semester - III Examination at the end of the Semester - III and MCM Semester - IV Examination at the end of Semester - IV in Second Year.
3. The Examinations Specified in above paragraph (i.e., Paragraph – 2) above shall be held twice a year (Winter + Summer) at such places and on such dates as may be fixed by the University.

4. The details of the procedure for admission as well as eligibility for examination of:

   (A) An applicant of the **MCMSemester – I** Examination shall have :

      (i) Obtained a Bachelor degree of this University or an equivalent Bachelor Degree of any statutory University in any faculty.

      (ii) Prosecuted a regular course of study for not less than one Semester in any recognized institution or college affiliated to the R. T. M. Nagpur University where the course will be conducted.

   (B) An applicant of the **MCMSemester - II** Examination shall have :

      Appeared MCM Semester – I Examination of this University

(C) An Applicant of MCM Semester - III Examination shall have passed MCM Semester - I and appeared in Semester - II Examination.

OR

Passed PGDCCA/Post B.Sc. Diploma in Computer Science & Application of RashtrasantTukadojiMaharaj Nagpur University, Nagpur.

(D) An applicant of MCM Semester - IV Examination shall have appeared in Semester - III Examination.

Admission to Semester	Candidate should have passed in following examinations	Candidate should have competed the term and filled examination form
Semester - I	Degree Examination	----
Semester - II	----	Semester – I
Semester - III	PGDCCA /PGDCS/ MCM Semester-I	(Not applicable for PGDCCA/ PGDCS) Semester-II
Semester - IV	-----	Semester - III

5. Without prejudice to the other provisions of Ordinance No. 6 relating to the Examinations in General, the provisions of Paragraphs 5, 7, 8, 10, 26 and 31 of the said Ordinance shall apply to every collegiate candidate.

6. The fees for the examination shall be as prescribed by the Management Council from time to time and whenever any change is made in the fees prescribed for any particular examination that shall be notified through a notification for information of the examinees concerned.

With the issuance of this Direction, The Direction No 43 of 2016 (Choice Based Credit System) shall stand repealed.

Sd/-

Nagpur **Dr. S. P. Kane**
Date : 29.08.2017 Vice-Chancellor

7. **Teaching and Examination Scheme**

Master of Computer Management (MCM)

(A) MCM Part-I

Semester – I

Course Code	Subjects	Paper	Teaching Scheme per weeks (hr)	End Sem Examination	Min Marks	Internal Assessment	Min Marks	Credits
Theory								
1T1	Fundamental of Information Technology	I	4	80	40	20	10	4
1T2	Programming in C & OOPs Concept	II	4	80	40	20	10	4
1T3	Introduction to Operating Systems	III	4	80	40	20	10	4
1T4	Computerized Accounting (Tally ERP 9)	IV	4	80	40	20	10	4
Practical								
1P1	**Practical-I :**Programming in C & Operating Systems	P-I	8	100	50	Nil	Nil	4
1P2	**Practical-II :**Tally (ERP 9)& MS-Office	P-II	8	100	50	Nil	Nil	4
	Total		32	520				24

Notes:

1. Duration of one Theory period is 1 hour and of Practical period is 2 hour.
2. The candidate has to pass theory papers and practical paper separately.
3. One credit is equivalent to one hour of Teaching or two hours of Practical Work per week.
4. Each semester will consist of 15 – 18 weeks of Academic Work equivalent to 90 actual teaching days.
5. The odd semester may be scheduled from July to December and even semester from January to June.

(B) MCM Part-I

Semester – II

Course Code	Subjects	Paper	Teaching Scheme per weeks (hr)	End Sem Examination	Min Marks	Internal Assessment	Min Marks	Credits
Theory								
2T1	Management Information Systems	I	4	80	40	20	10	4
2T2	Core Java	II	4	80	40	20	10	4
2T3	Quantity Techniques & Operation Research	III	4	80	40	20	10	4
2T4	E-Commerce and Web Designing	IV	4	80	40	20	10	4
Practical								
2P1	**Practical-I :**Core Java	P-I	8	100	50	Nil	Nil	4
2P2	**Practical-II :** HTML, JavaScript	P-II	8	100	50	Nil	Nil	4
	Total		32	520				24

Notes:

1. Duration of one Theory period is 1 hour and of Practical period is 2 hour.
2. The candidate has to pass theory papers and practical paper separately.
3. One credit is equivalent to one hour of teaching or two hours of practical Work per week.
4. Each semester will consist of 15 – 18 weeks of academic Work equivalent to 90 actual teaching days.
5. The odd semester may be scheduled from July to December and even semester from January to June.

(C) MCM Part-II

Semester – III

Course Code	Subjects	Paper	Teaching Scheme per weeks (hr)	End Sem Examination	Min Marks	Internal Assessment	Min Marks	Credits
Theory								
3T1	Advance Database Management System	I	4	80	40	20	10	4
3T2	Principles & Techniques of Management	II	4	80	40	20	10	4
3T3	**Electives :** (i) PHP & MySQL (ii) VB.Net (iii) C#.Net	III	4	80	40	20	10	4
3T4	**Compulsory Foundation** (i) Research Methodology	IV	4	80	40	20	10	4
Practical								
3P1	**Practical- I :**SQL & PL/SQL	P-I	8	100	50	Nil	Nil	4
3P2	**Practical-II :**Electives	P-II	8	100	50	Nil	Nil	4
	Total		32	520				24

Notes:

1. Duration of one Theory period is 1 hour and of Practical period is 2 hour.
2. The candidate has to pass theory papers and practical paper separately.
3. One credit is equivalent to one hour of teaching or two hours of practical work per week.
4. Each semester will consist of 15 – 18 weeks of academic work equivalent to 90 actual teaching days.
5. The odd semester may be scheduled from July to December and even semester from January to June.

(D) MCM Part-II

Semester – IV

Course Code	Subjects	Paper	Teaching Scheme per weeks (hr)	End Sem Examination	Min Marks	Internal Assessment	Min Marks	Credits
Theory								
4T1	ASP.Net	I	4	80	40	20	10	4
4T2	**Electives:** (i) Advance Java (ii) Android Programming (iii) Python	II	4	80	40	20	10	4
4T3	**Elective Foundation:** (i) Big Data &Hadoop (ii) Software Engineering (iii)Strategic Management	III	4	80	40	20	10	4
Practical								
4P1	**Practical-I:**ASP.Net	P-I	8	100	50	Nil	Nil	4
4P2	**Practical-II:**Electives	P-II	8	100	50	Nil	Nil	4
Project								
4P3	PROJECT	Project	8	100	50	-------	------	4
	Total		36	540				24

Notes:

1. Duration of one Theory period is 1 hour and of Practical period is 2 hour.
2. The candidate has to pass theory papers and practical paper separately.
3. One credit is equivalent to one hour of teaching or two hours of practical work per week.
4. Each semester will consist of 15 – 18 weeks of academic work equivalent to 90 actual teaching days.
5. The odd semester may be scheduled from July to December and even semester from January to June.

8. In order to pass the examination, an examinee shall obtain not less than 50 % marks in each of the theory papers and each of the practical and the project and Internal Assessment (Sessional) separately.

(A) An examinee who is unsuccessful in the examination shall be eligible for admission to the subsequent examinations on payment of a fresh fee prescribed for the examination together with the conditions of the ordinance in force from time to time.

9. (A) The scope of the subjects and pattern of examination shall be as indicated insyllabi.

(B) The Medium of instructions and examinations shall be in ENGLISH only.

10. Applicant for MCM Examination prosecuting regular course of study shall not bepermitted to join any other course in this or any other University.

11. **ASSESSMENT**

- The final total assessment of the candidates is made in terms of an internal assessment (Sessional) and an external assessment for each course.
- For each paper, 20 marks will be based on internal assessment and 80 marks for semester end examination (external assessment), unless otherwise stated.
- The division of the 20 marks allotted to internal assessment of theory papers should based on class test, attendance, project assignments, seminar, power point presentation, fieldwork, group discussions or any other innovative practice / activity as determined by the teacher in respective subject and moderated by Head of the Institute/Principal.

Sr. No	Parameters	Max. Marks
1	Internal Marks on the basis of Class Attendance	05
2	Internal Marks on the basis of Class Assignment/ Test	05
3	Internal Marks on the basis of Students Seminar / Students Lecture Forum	05
4	Internal Marks on Students Overall Performance	05
Total Internal Assessment Marks		**20**

- There shall be no separate / extra allotment of workload to the concerned teacher. He/ She shall conduct the internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.
- At the beginning of each semester, every teacher shall inform his / her students unambiguously the method he / she propose to adopt and the scheme of marking for internal assessment with the prior permission of HOD / principal.

- An unsuccessful examinee at any internal shall be eligible for reexamination on payment of fresh examination fee prescribed by the University as per the respective directions.
- The internal marks will be communicated to the University at the end of each semester, but before the semester end examinations. These marks will be considered for the declaration of the results.
- The record of internal marks, evaluation & result should be maintained for a period of one year by respective institute/college for verification by competent authority.
- The maximum and minimum marks which each subject carries in MCM Semester - I, Semester - II, Semester - III and Semester - IV Examination are as indicated in Paragraph 7. A, B, C and D respectively.
- A copy of Project work shall be submitted to college prior to commencement of Semester - IV Examination for Evaluation by Internal and External Examiner appointed as per University rules.
- Candidate shall submit his/her declaration that the Project is a result of his/her own work and the same has not been previously submitted to any examination of this University or any other University.
- The Practical Examination of each Semester will be conducted by Internal and External Examiner appointed as per University rules.
- The old course students shall be absorbed as per the absorption scheme mentioned in Appendix D.
- If an examinee failed to pass the MCM Degree within five successive years from the date of his/her first admission to particular programme he/she shall be declared as **"Not Fit for the Course" (NFC)** and he/she will not be allowed to appear further for any examination of the course.

STANDARD OF PASSING

- Every candidate must secure 50% marks in each head of passing.
- The passing marks for external examination will thus be 40 out of 80 and for internal examination, 10 out of 20 and aggregate marks taking both together will be 50 marks.
- There shall be no internal marks in Practical and Project Examination.

11. (A) There shall be no classification of examinees successful at the MCM Semester-I, Semester – II, Semester - III and Semester-IV Examinations whereas SGPA will be notified.

*** Conversion of Marks to Grades and Calculations of SGPA (Grade Point Average) and CGPA (Cumulative Grade Point Average):** In the Credit and

Grade Point System, the assessment of individual Courses in the concerned examinations will be on the basis of marks only, but the marks shall later be converted into Grades by some mechanism wherein the overall performance of the Learners can be reflected after considering the Credit Points for any given course. However, the overall evaluation shall be designated in terms of Grade. There are some abbreviations used here that need understanding of each and every parameter involved in grade computation and the evaluation mechanism. The abbreviations and formulae used are as follows:-

Abbreviations and Formulae Used

G: Grade

GP: Grade Points

C: Credits

CP: Credit Points

CG: Credits X Grades (Product of credits & Grades)

SGPA = ΣCG: Sum of Product of Credits & Grades points / ΣC: Sum of Credits points

SGPA: Semester Grade Point Average shall be calculated for individual semesters. (It is also designated as GPA)

CGPA: Cumulative Grade Point Average shall be calculated for the entire Programme by considering all the semesters taken together.

After calculating the SGPA for an individual semester and the CGPA for entire programme, the value can be matched with the grade in the Grade Point table as per the ten (10) Points Grading System and expressed as a single designated GRADE such as O, A+, A, B+, B, etc.

Marks	Grade	Grade Points
85 and above	O (Outstanding)	10
75 - 84	A+ (Distinction)	9
71 - 74	A (Very Good)	8
61 - 70	B+ (Good)	7
55 - 60	B(Above Average)	6
50 - 54	C (Average)	5
00 - 49	F (Fail)	0
	AB (Absent)	0

A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

(B) Division at the MCMSemester - IV Examination shall be declared based on the aggregate marks at the MCMSemester - I, Semester – II, Semester - III and Semester - IV Examination taken together and the CGPA will be calculated and notified.

(C) Successful examinees at the MCM Semester - IV Examination shall be awarded division based on CGPA as follows:

CGPA Range	Final Grade	Equivalent Class/ Division
9.01 to 10.00	O	First Division (Outstanding)
8.01 to 9.00	A+ (Distinction)	First Division(Distinction)
7.01 to 8.00	A(Very Good)	First Division (Very Good)
6.01 to 7.00	B+(Good)	First Division (Good)
5.55 to 6.00	B(Above Average)	Second Division (Above Average)
5.00 to 5.54	C(Average)	Second Division (Average)
0.00 to 4.99	F (Fail)	Fail
0	AB(Absent)	Absent

12. Successful examinees in the MCMSemester Examination shall be awarded Distinction in each subject in which examinees obtain 75% or more marks in that subject at the respective Examination.
13. Unsuccessful examinees at the above examinations can be readmitted to the same examination on payment of a fresh fee and such other fees as may be prescribed by university.
14. Provisions of ordinance No 3 of 2007, relating to the award of grace marks for passing an examination, securing higher division / class and for securing distinction in subject(s) shall be applicable.
15. Notwithstanding anything to the contrary in this Direction, no person shall be admitted to an examination under this Ordinance, if he/ she has already passed the same examination or an equivalent examination of any other University.
16. Examinees successful at MCMSemester - I, Semester - II, Semester-III and Semester-IV Examination shall on payment of the prescribed fees receive a Degree in the prescribed form signed by the Vice-Chancellor.
17. This Scheme shall come into force from the academic session 2016-17.
18. The Provisions of Ordinance No. 21 of 1994 governing the existing course for Master of Computer Management stands repealed physically on implementation of this Direction.

APPENDIX –A

QUESTION PAPER PATTERN

First / Second / Third / Fourth Semester Master of Computer Management (MCM) Examination
Choice Based Credit System (CBCS)

Subject Name
Paper - I

Time: 3 Hours **Total Marks: 80**

N. B. - a) Draw well labeled diagram wherever necessary.
b) All questions are compulsory.

Part - A

N. B. – 1. Each question carries two marks.
2. Answers should not more than five lines.

Q1. **8 x 2 = 16**

a. } Unit - I
b. }

c. } Unit - II
d. }

e. } Unit - III
f. }

g. } Unit - IV
h. }

Part - B

N. B. – 1. Each question carries three marks.
2. Answers should not more than ten lines.

Q2. **8 x 3 = 24**

a. } Unit - I
b. }

c. } Unit - II
d. }

e. } Unit - III
f. }

g. } Unit - IV
h. }

Part - C

N. B. – 1. Each question carries five marks.

2. Answers should not more than 400 words for 5 marks questions and 600 words for 10 Marks questions respectively.

Q3. **Either**

(A)	Unit - I		5
(B)			5
		OR	
(C)			10

Q4. **Either**

(A)	Unit - II		5
(B)			5
		OR	
(C)			10

Q5. **Either**

(A)	Unit - III		5
(B)			5
		OR	
(C)			10

Q6. **Either**

(A)	Unit - IV		5
(B)			5
		OR	
(C)			10

APPENDIX –B

(A) Project and Classification of Marks on Project

Towards the end of the second year of study, a student will be examined in the course "Project Work".

a. Project Work may be done individually or in groups (Maximum 3 students) in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.
b. The Project Work should be done using the tools covered in Master of Computer Management.
c. The Project Work should be of such a nature that it could prove useful or be relevant from the commercial / management angle.
d. The project work will carry 100 marks.
e. Project Work can be carried out in the Institute or outside with prior permission of the Institute.
f. The external viva-voce examination for Project Work would be held as per the Examination Time Table of the second year of study, by a panel of one external and one Internal Examiner.

Types of Project

As majority of the students are expected to work out a project in some industry/research and development laboratories/educational institutions/software export companies, it is suggested that the project is to be chosen which should have some direct relevance in day-today activities of the candidates in his/her institution. The Applications Areas of project - Financial/Marketing/Database Management System/ Relational Database Management System/E-Commerce /Internet/ Manufacturing/ web Designing / Scientific / ERP etc.

Project Proposal (Synopsis)

The project proposal should be prepared in consultation with the guide. The project guide must be a person having minimum Qualification MCM/ M.Sc. (Computer Science + Information Technology)/ M.Sc. (Mathematics /Electronics/Statistics/Physics + Post B.Sc. Diploma in Computer Science& Application)/MCA. The project proposal should clearly state the objectives and environment of the proposed project to be undertaken. It should have full details in the following form:

Format of Synopsis for Desktop Application

1. Title of the Project.
2. Objectives of the Project.
3. Project Category (DBMS/RDBMS/OOPSetc.).

4. Tools/Platform and Languages to be used.
5. Complete Structure of the System:
    i. Numbers of Modules and its Description.
    ii. Modular Chart / System Chart.
    iii. Data Structures or Tables.
    iv. Process Logic of each Module.
    v. Types of Report Generation.
6. References.

Note: Synopsis should not be more than 3-4 pages.

Format of Synopsis for Web Application

1. Title of the Project.
2. Objectives of the Project.
3. Project Category (DBMS/RDBMS/OOPSetc.).
4. Tools/Platform and Languages to be used.
5. Complete Structure of the System:
    i. Number of pages and links their short description.
    ii. Use / Information of Pages.
    iii. Feedback Form (if any).
6. References.

Note: Synopsis should not be more than 3-4 pages.

Project Report Formulation

Front Page.

College Certificate Page.

Declaration Page.

Acknowledgment Page.

Project Profile.

Index or Content Page.

    i. *Contents ——————————.

Appendices

    i. List Figures, Tables& Charts.
    ii. Approved copy of Synopsis.

Glossary

*** Contents.**

    i. Introduction.
    ii. Objectives.
    iii. Preliminary System Analysis.
        - Preliminary Investigation.
        - Present System in Use.
        - Flaws in Present System.
        - Need of New System.
        - Feasibility Study.

- Project Category.

iv. Software Engineering Paradigm Applied
- Modules
- System / Modular Chart.

v. Software & Hardware Requirement Specification.

vi. Detailed System Analysis.
- Data Flow Diagram.
- Numbers of Modules and Process Logic.
- Data Structures and Tables.
- Entity-Relationship Diagram.

vii. System Design.
- Form Design.
- Source Code.
- Input screen & Output Screen.

viii. Testing &Validation Checks.

ix. System Security Measures.

x. Implementation, Evaluation and Maintenance.

xi. Future Scope of the project.

xii. Suggestion & Conclusion

xiii. Bibliography& References.

Note :-

i. A Student is expected to complete the Assignments based on Syllabus of Practical subjects and submit the same in the form of a files (assignment Record) at the end of Academic Session for the evaluation purpose.

ii. A student should submit internal assessment of each theory paper prescribed by the subject teacher.

iii. A Student is expected to deliver a seminar on any course curricular subject / latest trends in IT relevant subject per semester for internal assessment.

Classification Of Marks on Project :-

Report & Documentation	40
Viva voce (External)	40
Viva voce (Internal)	20
Total Marks	**100**

The marks of Project shall be notified as a whole out of 100 in Foil/C-Foil.

(B)Practical and Classification of Marks on Practical

1. Practical exam shall be of 4 hours duration.
2. The Practical Record of every student shall carry a certificate as shown below, dulysigned by the teacher-in-charge and the Head of the Department.

3. If the student fails to submit his / her certified Practical Record duly signed by theTeacher-In-Charge and the Head of the Department, he / she shall not be allowed toappear for the Practical Examination and no Marks shall be allotted to the student.
4. After Viva-Voce and evaluation of practical records of a student by the Internal & External Examiner, both examiners should sign on the certificate of practical records.
5. The certificate template shall be as follows:

Name of the college / Institution
Name of the Department:

CERTIFICATE

This is to certify that Mr./Mrs./Ms. _____
of class MCM Part _____ Semester _____ has satisfactorily completedthe practical experimentsprescribed by RashtrasantTukadojiMaharaj Nagpur University for the subject _____ during the academic year _____.

Signature
Practical In-charge Head of the Department

Signature
Head of the Department

Signature
Internal Examiner

Signature
External Examiner

Date: _____

Classification Of Practical Marks :-

Practical – I		**Marks**
1.	Writing a Program or Problem (Algorithm & Flowchart)	40
2.	Execute on a computer	
3.	Taking Hard Copy	
Practical – II		
1.	Writing a Program or Problem (Algorithm & Program)	20
Viva Voce		20
Practical Record		20
Total Marks		**100**

The marks of Practical shall be notified as a whole out of 100 in Foil/C-Foil.

APPENDIX –C

Absorption Scheme MCM

It is notified for general information of all concerned that the failure students of **MCM OldCourse (SemesterPattern)** shall be absorbed in the **New Course CBCS Pattern** introduced from the session 2016-2017 Examination with the following scheme.

1) The Failure students of **MCM – I (Semester – I & Semester - II) and MCM – II (Semester – III & Semester - IV)** as per Old Course (Semester Pattern) **appeared in Sum 2016** should clear their backlog papers of MCM – I (Semester – I & Semester - II) and MCM – II (Semester – III & Semester - IV) Old Course (Semester Pattern) **till Winter 2017**. If they fail to complete & pass till Winter 2017, then they will have to appear in parallel papers of New Course CBCS Pattern (Choice Based Credit System) as per absorption scheme indicated in Appendix - D.

2) The Failure students of **MCM – II (Semester – III)** as per Old Course (Semester Pattern) **appeared in Winter 2016** should clear their backlog papers of MCM – II (Semester - III) Old Course (Semester Pattern) **till Summer 2018**. If they fail to complete & pass till Summer 2018, then they will have to appear in parallel papers of New Course CBCS Pattern (Choice Based Credit System) as per absorption scheme indicated in Appendix - D.

3) The Failure students of **MCM – II (Semester – IV)** as per Old Course (Semester Pattern) **appeared in Summer 2017** should clear their backlog papers of MCM – II (Semester - IV) Old Course (Semester Pattern) **till Winter 2018**. If they fail to complete & pass till Winter 2018, then they will have to appear in parallel papers of New Course CBCS Pattern (Choice Based Credit System) as per absorption scheme indicated in Appendix - D.

APPENDIX –D

(A) MCM Part – I (Semester - I)

Old Course (Semester Pattern)➔New Course CBCS Pattern (Choice Based Credit System)

Sr. No	Old Course (Semester Pattern)	M. Marks	Sr. No	New Course CBCS Pattern (Choice Based Credit System)	Max Marks
Semester – I					
Theory			**Theory**		
I	Fundamental of Information Technology	80	1T1	Fundamental of Information Technology	80
II	Programming in C	80	1T2	Programming in C & OOPs Concept	80
III	Introduction to Operating Systems	80	1T3	Introduction to Operating Systems	80
IV	Computerized Accounting (Tally)	80	1T4	Computerized Accounting (Tally ERP 9)	80
Practical			**Practical**		
P - I	**Practical - I :** Programming in C & Operating Systems	100	1P1	**Practical - I :** Programming in C & Operating Systems	100
P - II	**Practical -II :** Tally & MS-Office	100	1P2	**Practical - II :** Tally (ERP 9) &Ms-Office	100

(B) MCM Part – I (Semester - II)

Old Course (Semester Pattern)➔New Course CBCS Pattern (Choice Based Credit System)

Sr. No	Old Course (Semester Pattern)	M. Marks	Sr. No	New Course CBCS Pattern (Choice Based Credit System)	Max Marks
Semester – II					
Theory			**Theory**		
I	Management Information Systems and Software Engineering	80	2T1	Management Information Systems	80
II	Visual Basic Programming	80	2T2	Core Java	80
III	Principles & Techniques of Management	80	2T3	Quantity Techniques & Operation Research	80
IV	E-Commerce and Web Designing	80	2T4	E-Commerce and Web Designing	80
Practical			**Practical**		
P - I	Practical-I : Visual Basic	100	2P1	**Practical-I :**Core Java	100
P - II	Practical-II : HTML, JavaScript	100	2P2	**Practical-II :** HTML, JavaScript	100

(C) MCM Part – II (Semester - III)

Old Course (Semester Pattern)➔New Course Pattern (Choice Based Credit System)

Sr. No	Old Course (Semester Pattern)	M. Marks	Sr. No	New Course Pattern (Choice Based Credit System)	Max Marks
Semester – III					
Theory			**Theory**		
I	Quantitative Techniques & OR	80	3T1	Advance Database Management System	80
II	Core Java	80	3T2	Principles & Techniques of Management	80
III	DBMS and oracle	80	3T3	**Electives :** (i) PHP & MySQL (ii) VB.Net (iii) C#.Net	80
IV	Research Methodology & Software Product & Project Management	80	3T4	**Compulsory Foundation** (i) Research Methodology	80
Practical			**Practical**		
P - I	Practical-I : Core Java	100	3P1	**Practical- I :**SQL & PL/SQL	100
P - II	Practical-II : Oracle	100	3P2	**Practical-II :**Electives	100

(D) MCM Part – II (Semester - IV)

Old Course (Semester Pattern)➔New Course Pattern (Choice Based Credit System)

Sr. No	Old Course (Semester Pattern)	M. Marks	Sr. No	New Course Pattern (Choice Based Credit System)	Max Marks
Semester – IV					
Theory			**Theory**		
I	Information Security & Cyber Laws	80	4T1	ASP.Net	80
II	PHP& My-SQL	80	4T2	**Electives:** (i) Advance Java (ii) Android Programming (iii) Python	80
III	Electives : (i) Advanced Java (ii) OOPS & C++ (iii) ASP.Net	80	4T3	**Elective Foundation:** (i) Big Data &Hadoop (ii) Software Engineering (iii)Strategic Management	80
Practical			**Practical**		
P - I	Practical-I : PHP& My-SQL	80	4P1	**Practical-I:**ASP.Net	100
P - II	Practical-II : Elective	100	4P2	**Practical-II:**Electives	100
Project			**Project**		
Proj	PROJECT	100	4P3	PROJECT	100

APPENDIX –E

MCM Part-I

Semester-I

Paper- I:Fundamental of Information Technology (1T1)

Unit – I

Computers: Introduction to computers, Characteristics of computer, Evolution of computer, Generations of computer, Basic organization of computer system (Block Diagram), Functioning of computer, Concept of system. **Number system:** non-positional number systems, Positional number systems, Conversion from one number system to another, Fraction numbers. **Computer codes:** BCD, EBCDIC, ASCII, Unicode, Collating sequence. **Computer arithmetic:** Need of binary, Binary arithmetic.

Unit – II

Processor & memory: Central processing unit (CPU), Components of CPU (CU, ALU, Instruction set, Registers, Processor speed, Type of processor), Main memory, Types of memory. **Secondary storage devices:** Sequential & direct access devices, Magnetic tapes, Magnetic disks, Optical disks, Memory storage devices, Mass storage devices, Data backup, On-line, Near line and Off-line storage, Hierarchical storage devices(HSS), Input-output devices.

Unit– III

Computer software: Define software, Types of software, Logical system architecture, Firmware, Middleware, Acquiring software, Software development life cycle (SDLC), Software engineering, CASE tools. **System implementation & operation:** Software testing & debugging (Types of program errors, Testing a program, Debugging a program for syntax errors & logical errors, Difference between testing & debugging), Software documentation, Software deployment, System evaluation, Software maintenance. **Business data processing:** Meaning of data processing, Data storage hierarchy, Standard methods of organizing data, File management system, Database management system.

Unit – IV

Data communication and computer networks: Basic elements of a communication system, Data transmission modes, Data transmission speed, Data transmission media, Digital & analog data transmission, Data transmission services, Multiplexing techniques, Switching techniques, Routing techniques, Network topologies, Types of network, Communication protocols, Network interface card (NIC), OSI model, Ernet working tools, Wireless Networks. **Multimedia:** What is multimedia, Multimedia components, Multimedia applications, and media center computer. **Classification of computers:** Notebook computers (Laptops), Personal computer (PCs), Workstations, Mainframe systems, Super computers, Client & server computers, Handheld computers (Tablet PC, PDA/Pocket PC, Smartphone).

Text Book:

1. P. K. Sinha&PritiSinha, Computer Fundamentals, BPB Publication.

Reference Books:

1. Madhulika Jain, Shashank Jain, Satish Jain, Information Technology Concepts, BPB Publication.
2. B. Ram, Computer Fundamentals (Architecture & organization), New Age International Publisher.
3. Turban, Rainer, Potter, Introduction to Information Technology, Wiley India Edition.
4. Peter Norton, Introduction to Computers, McGraw-Hill Education.
5. S. Jaiswal, I.T. Today, Encyclopedia.

Practical List ofFundamental of Information Technology

A1. Use a contemporary letter template of MS-WORD and provide information about launching of new products of a company.
Also write down the steps to perform above in MS-WORD.

A2. Use a professional letter template of MS-WORD and write an application to the principal for two days leave.
Also write down the steps to perform above in MS-WORD.

A3. Using Mail Merge of MS-WORD, write a letter to the students of MCM-I to submit their Original Documents (Mark Sheet, Migration Certificate, TC etc) along with their balance fees up to 10th March 2008 in the office of the college during office timings morning 8:00 AM to 5:00 PM.
Also write down the steps to perform above in MS-WORD.

A4. Using Mail Merge of MS-WORD, write a letter to your friends, invite them on your Birth Day Party on 10th March 2008 at the Venue- B04, Amar Apartment, Narendranagar, Nagpur-440021
Also write down the steps to perform above in MS-WORD.

A5. Using Mail Merge of MS-WORD, write a letter to all the selected candidate for their final interview on 10th March 2008 at the Centre Point College, 7 Nawab Layout, Tilaknagar, Nagpur-10 at 11:00 AM along with all original documents and 2 passport size photographs.
Also write down the steps to perform above in MS-WORD.

A6. Draw and Analyze the DFD of Book Issuing System of College Library in MS-PowerPoint.
Also write down the steps to perform above in MS-POWERPOINT.

A7. Draw and Analyze the DFD of Hotel Management System in MS-PowerPoint.
Also write down the steps to perform above in MS-POWERPOINT.

A8. Draw and Analyze the DFD of Examination Management System in MS-PowerPoint.
Also write down the steps to perform above in MS-POWERPOINT**.**

A9. Create a Mark-Sheet of MCM-Part I using MS-Excel. Mark-Sheet format should be as per below. Fill the information about 10 students.

Roll No.	Name of Student	IT (100)	ICP (100)	IOS (100)	C (100)	MIS& SA (100)	Practical-I (100)	Practical-II (100)	Total Marks (Out of 700)	% age
1										

Draw a pie chart for above Mark-sheet
Also write down the steps to perform above operation in MS-EXCEL.

A10. Create a Employee Payment Sheet using MS-Excel. Employee Payment Slip format should be as per below. Fill the information about 10 employees.

Sr.No.	Name of Employee	Basic Salary	HRA 5%	TA 7%	DA 9%	Gross_Salary
1						
Total salary						

Draw a bar chart for above Employee Payment Sheet
Also write down the steps to perform above operation in MS-EXCEL.

A11. Create the following Product sheet in MS-EXCEL and perform the operation given below:

Sr.No.	Product Name	Company Name	Country	Quantity	Rate
1	Butter	Amul India ltd	India	20	Rs.19.00
2	Milkmaid	Amul India ltd	India	10	Rs.35.00
3	Tea	Hindustan Lever ltd	Malaysia	15	Rs.40.00
4	Biscuits	Parle ltd	India	32	Rs.12.00
5	Papad	Haldiram ltd	India	12	Rs.10.00
6	Chocolate	Cadbury ltd	Australia	150	Rs.15.00
7	Paneer	Amul India ltd	India	23	Rs.25.00
8	Bournvita	Cadbury ltd	Australia	20	Rs.45.00
9	Poppins	Parle ltd	India	27	Rs.6.00
10	Sauce	Amul India ltd	India	16	Rs.21.00

a) Sort by Product Name, by company name, by country in ascending order.
b) Sort by Country in descending order.
Also write down the steps to perform above operation in MS-EXCEL.

A12. Create the following Product sheet in MS-EXCEL and perform the operation given below:

Sr.No.	Product Name	Company Name	Country	Quantity	Rate
1	Butter	Amul India ltd	India	20	Rs.19.00
2	Milkmaid	Amul India ltd	India	10	Rs.35.00
3	Tea	Hindustan Lever ltd	Malaysia	15	Rs.40.00
4	Biscuits	Parle ltd	India	32	Rs.12.00
5	Papad	Haldiram ltd	India	12	Rs.10.00
6	Chocolate	Cadbury ltd	Australia	150	Rs.15.00
7	Paneer	Amul India ltd	India	23	Rs.25.00
8	Bournvita	Cadbury ltd	Australia	20	Rs.45.00
9	Poppins	Parle ltd	India	27	Rs.6.00
10	Sauce	Amul India ltd	India	16	Rs.21.00

a) List only those records whose country =”India”.
b) List only those records whose company name=”Amul”.
Also write down the steps to perform above operation in MS-EXCEL.

A13. Create the following Product sheet in MS-EXCEL and perform the operation given below:

Sr.No.	Product Name	Company Name	Country	Quantity	Rate
1	Butter	Amul India ltd	India	20	Rs.19.00
2	Milkmaid	Amul India ltd	India	10	Rs.35.00
3	Tea	Hindustan Lever ltd	Malaysia	15	Rs.40.00
4	Biscuits	Parle ltd	India	32	Rs.12.00
5	Papad	Haldiram ltd	India	12	Rs.10.00
6	Chocolate	Cadbury ltd	Australia	150	Rs.15.00
7	Paneer	Amul India ltd	India	23	Rs.25.00
8	Bournvita	Cadbury ltd	Australia	20	Rs.45.00
9	Poppins	Parle ltd	India	27	Rs.6.00
10	Sauce	Amul India ltd	India	16	Rs.21.00

a) List the records whose quantity is >= 10 and <= 100.
b) List the records whose rate is >= Rs. 35.00.
Also write down the steps to perform above operation in MS-EXCEL.

A14. By the help of following information prepare cost sheet for the month of March 1980:

	Rs.
1. Stock (1-3-1980)	
a) Raw Materials	25,000
b) Finished goods	17,360
2. Stock (31-3-1980)	
a) Raw Materials	26,250
b) Finished goods	15,750
3. Raw material purchased	21,900
4. Work-in-progress (1-3-80)	8,220
5. Work-in-progress (31-3-80)	9,100
6. Sale of finished goods	72,310
7. Direct wages	17,150
8. Unproductive Wages	830
9. Factory Expenses	8,340
10. Office and management expenses	3,160
11. Selling and distribution expenses	4,210

Prepare cost sheet and find out following information:
1) Total Cost 2) Cost of goods sold 3) Profit on sold out goods
Also write down the steps to perform above operation in MS-EXCEL.

A15. Following information is received from the books of a factory:

1. Closing stock of raw materials	25,150
2. Closing stock of finished goods	14,650
3. Raw materials purchased	20,800
4. Work in progress (1-1-78)	8,220
5. Work in progress (31-12-78)	8,000
6. Opening stock of raw material	24,000
7. Opening stock of finished goods	16,200
8. Sale of finished goods	62,800
9. Office expenses	2,150

10. Selling and Distribution expenses	4,000
11. Direct wages	16,000
12. Factory expenses	9,000

Prepare cost sheet and find out the following items:
1) Cost of materials consumed 2) Production Cost 3) Cost of goods sold 4) Net profit.
Also write down the steps to perform above operation in MS-EXCEL.

A16. By the help of following information prepare a statement of cost and in that statement indicate prime cost, works cost, office cost (production cost) and cost of goods sold, for the half year ending 30th June, 1978. Production 500 units.

1. Material consumed	30,000
2. Direct Wages	40,000
3. Direct Expenses	4,000
4. Works on Cost Expenses	
a) Unproductive wages	9,000
b) Factory lighting and heating	11,000
c) Factory rent, rates and insurance	3,000
d) Factory Director's fees	
e) Depreciation of machinery	1,500
f) Factory stationery	375
g) Factory cleaning	400
h) Depreciation of loose tools	900
i) Indirect material	500
j) Estimating expenses	500
5. Office expenses (Office overhead)	
a) Director fees	3,000
b) Office printing and stationery	750
c) Legal Expenses	500
d) Depreciation of office building	800
e) Bank fee	75
f) Salary of office employees	5,000
6. Selling and Distribution expenses	
a) Selling commission	1,000
b) Rent of warehouse	1,800
c) Bad debt	150
d) Advertisement	500
e) Depreciation and maintenance of delivery vans	700

Also write down the steps to perform above operation in MS-EXCEL.

A17. Prepare cost sheet by the help of following information and find out (i) Prime cost (ii) Factory cost (iii) Total Cost; (iv) Net Profit.

1.Raw Material purchased		66,000
2.Direct wages	52,500	
3.Indirect wages	2,750	
4.Stock of Raw Materials (1-9-83)		75,000
5.Stock of Raw material (30-9-83)		91,500
6.Stock of finished goods (1-9-83)		54,000
7.Stock of finished goods (30-9-83)		31,000
8.Stock of work in progress (1st Sep.83)		28,000
9.Stock of work in progress (30th sept.83)		35,000
10.Sales		2,11,000
11.Rent, rates and electric of factory		15,000
12.Depreciation of machinery		3,500
13.Carriage inward		1,500
14.Sundry factory exp.		10,000

15.Travelling wages and commission		6,500
16.Office rent and rates		2,500
17.Sundry Office expenses		6,500
18.Advertisement	3,500	
19.Carriage outward exp.(exp. on sale)		2,500

Also write down the steps to perform above operation in MS-EXCEL.

A18. By the help of following information prepare cost sheet for the year 1976.

1.Opening Stock (1-1-1976)		
a) Of Raw Materials	22,000	
b)Of Unfinished goods	5,000	
c)Of Finished goods	10,000	
2.Closing Stock: (31-12-76)		
a) Of Raw Materials	2,350	
b) Of Unfinished goods	3,000	
c) Of Finished goods	2,000	
3.Direct Wages		30,000
4.Direct Expenses		10,000
5.Material Purchased	70,500	
6.Carriage Inward		2,000
7.Factory on cost		70,000
8.Factory Supervision		8,800
9.Office Rent		6,000
10.Factory Rent		9,000
11.Rent of sales department		6,000
12.Lighting bill (out of this 30% of factory, 20% of sales dept. and balance for office)		10,000
13.Advertisement		6,000
14.Salary of Manager (30% of Factory, 40% of Sales dept. and balance for office)		37,000
15.Profit 10% on total cost.		

Also write down the steps to perform above operation in MS-EXCEL.

A19. Following information is available from the books of Zenith manufacturing company as on 31st Dec. 1974.

1.Salary of Drawing room staff		6,500
2.Salary of distribution department	12,600	
3.Outward carriage expenses		4,300
4.Cash discount		2,900
5.Inward carriage exp. on purchase	7,150	
6.Bad debts written off	6,500	
7.Machine repairing	4,450	
8.Rent, taxes and insurance (Factory)		8,500
9.Rent, taxes and insurance (office)		2,000
10.Sales	4,61,100	
11.Stock of Raw material (31-12-73)	62,800	
12.Stock of Raw material (31-12-74)	48,000	
13. Material Purchased	1,85,000	
14. Travelling Expenses		2,100
15.Salary and Commission of travelling agent		7,700
16.Productive wages	1,26,000	
17.Depreciation of machinery & equipment		6,500
18.Depreciation of office furniture	300	
19.Director fee		6,000
20.Gas and Water (Factory)		1,200
21.Gas and Water (Office)		400
22.Salary of manager (3/4 for factory & 1/4 for office)	10,000	

23.General Expenses			3,400
24.Income tax		1,500	
25.Dividend	1,000		

Prepare cost sheet and indicate the following items:-
1) Materials Consumed (2) Prime cost (3) Factory on cost and factory cost(4) General and selling overhead (5) Total cost (6) Net profit (7) Percentage of factory on cost to wages (8) percentage of general overhead to factory cost.
Also write down the steps to perform above operation in MS-EXCEL.

A20. From the given information prepare Flexible budget for the capacity 70%, 80% & 100 % & show the results.
The sales for the above capacity would be 50,00,000/-, 60,00,000/-, 85,00,000 respectively. Fixed expenses will be constant at all capacities. Semi variable will be constant between 55% to 75% capacity.
It will be increased by 10% between the capacity 75% to 90% & will be increased by 20% between the capacity 90% & 100%. Following expare on the capcity of 60%.

Particulars	Rs.
Semi variable exp:	
Maintenance & repairs	1,25,000
Labour	5,00,000
Sales dept. Expenses	1,50,000
Other overheads	1,25,000
	9,00,000
Variable Cost :	
Material	12,00,000
Labour	13,00,000
Other Expenses	2,00,000
	27,00,000
Fixed Cost :	
Wages & salaries	4,20,000
Rent & Taxes	2,80,000
Depreciation	3,50,000
Other overheads	4,50,000
	15,00,000
Total Cost	51,00,000

Also write down the steps to perform above operation in MS-EXCEL.

A21. The following data is taken from the manufacturing record of a company for 1/2 year period.

Fixed expenses:		
Wages & salaries	84,000	
Rent, rates & taxes	56,000	
Depreciation	70,000	
Sundry administration Exp.	89,000	
		2,99,000
Semi-variable exp : (at 50% capacity)		
Maintenance & Repairs	25,000	
Indirect Labour	99,000	
Sales Department salaries	29,000	
Sundry administration exp.	26,000	
		1,79,000
Variable Exp. (at 50% capacities)		
Materials	2,40,000	
Labour	2,56,000	
Other expenses	38,000	

5,34,000

Assume that the fixed expenses remain constant for all levels of production. Semi- Variable expenses remain constant between 45% & 65% of capacity. Increasing by 10% between 65% & 80% capacity & by 20% between 80% & 100% of capacity. Sales at various levels are :-

Capacity	Rs.
60%	10,00,000
75%	12,00,000
90%	15,00,000
100%	17,00,000.

Prepare Flexible budget for the above capacity.
Also write down the steps to perform above operation in MS-EXCEL.

A22. The following budget is prepared for 10,000 units. Per unit cost will be as under:-

Particualrs	P.U. (Rs.)
Material	60
Wages	55
Fixed cost (2,00,000)	20
Variable expenses	5
Selling expenses (10% fixed)	15
Administration exp. (90,000)	9
Distribution exp. (20% fixed)	15

Prepare budget for 7,500 & 6,500 units.
Also write down the steps to perform above operation in MS-EXCEL.

A23. The following figures are available from sales & cost forecast of M/s ALANKAR & Co. for the year ended 31st.Dec. 1990 at 50% (5,000 units) capacity. Prepare a profit forecast statement through flexible budget at 60%, 75%, 90% & 100% capacity assuming that

1) The fixed expenses remain constant for all levels of production & sales.
2) Selling price between 50% & 75% capacity is Rs. 25/- per unit.
3) Semi variable expenses will remain unchanged at 50% & 65% capacity but will increase by 10% between 65% to 80% capacity& by 30% between 80% & 100% capacity.
4) At 90% level (capacity) material Cost increase by 5% & Selling Price is reduced by 5%.
5) At 100% level both material &labour cost increase by 10% & selling Price is reduced by 8%.
6) Semi variable expenses are Rs. 50,000 /-
7) Fixed expenses are Rs. 50,000/-
8) Variable expenses are : Material Rs. 5 p.u.
LabourRs. 2 p.u.
Direct Exp. Rs. 1 p.u.

Also write down the steps to perform above operation in MS-EXCEL.

A24. Prepare Flexible budget & find out overhead rate.

Particulars	50% Rs.	60% Rs.	70% Rs.
Variable Overheads			
A) Material	---	60,000	---
B) Labour	---	24,000	---
Semi-Variable Exp.			
1) Electric (20% fixed)	---	15,000	---
2) Repairs &Maint. (20% variable)	---	7,500	---
Fixed Expenses			

a) Depreciation	---	20,000	---
b) Rent & tax	---	2,250	---
c) Insurance	---	2,500	---
d) Salary	---	15,000	---
e) Indirect wages	---	8,000	---
Budgeted Direct labour hours	---	30,000	---

Also write down the steps to perform above operation in MS-EXCEL.

A25. Estimated cash balance on 1st may 1990 Rs. 2,50,000 From the following information Prepare Cash budget for the month of may, June, July 90.

Month	Sales	Purchase	Wages	Manu. Exp.	Office Exp.	Selling Exp.
March	50,000	30,000	6,000	5,000	4,000	3,000
April	56,000	32,000	6,500	5,500	4,000	3,000
May	60,000	35,000	7,000	6,000	4,000	3,500
June	80,000	40,000	9,000	7,500	4,000	4,500
July	90,000	40,000	9,500	8,000	4,000	4,500

Adjustments:-

a) Out of total sale 20% sales in cash & balance will be collected in the next month.

b) Suppliers allowed the credit period of 2 months.

c) Wages and all other exp. will be paid in the following months.

d) Dividends to share holders& Bonus to employees will be paid in the month of mayRs. 10,000 &Rs. 15,000 Respectively.

e) An order of machine is given, the cost of which is Rs. 80,000, Machine will be received in the month of June & payment will be done in same month.

f) Income tax will be paid Rs. 25,000/- in the month of July.

Also write down the steps to perform above operation in MS-EXCEL.

A26. From the following information Prepare Cash budget for the 3 months ending 30^{th} June.

Month	Sales	Materials	Wages	Overheads
Jan	60,000	40,000	11,000	6,200
Feb.	56,000	48,000	11,600	6,600
Mar.	64,000	50,000	12,000	6,800
Apr.	80,000	56,000	12,400	7,200
May	84,000	62,000	13,000	8,600
June	76,000	50,000	14,000	8,000

a) Payment of material & overheads will be done in the following month.

b) Payment of wages will be done in the same month.

c) Terms & conditions of sales as under :- Half amount of credit sales will be recovered in following months & balance amount will be recovered in the next month of the following month.

d) Dividend on Preference shares Rs. 30,000/- will be paid on 1st may.

e) The amount of share call each Rs. 25,000/- will be received on 1st April & of 1st June each.

f) Machines costing Rs. 10,000/- will be established in the month of January but payment will be done in the month of June.

g) The selling commission 5% will be paid in the following months of actual sales.

h) On 1st April Expected Cash balances Rs. 20,000/-

Also write down the steps to perform above operation in MS-EXCEL.

A27. From the following information Prepare Cash budget for 3 months commencing from 1st June. On 1st June Cash balance is Rs. 1,00,000/-

Month	Sales	Purchase	Wages	Manu. Exp	Selling&Admn. exp.

April	80,000	41,000	5,600	3,900	10,000
May	76,500	40,500	5,400	4200	1400
June	78500	38500	5400	5100	15000
July	90,000	37,000	4,800	5,100	17000
Aug.	95,500	35,000	4,700	6,000	13000

Additional Information :-

1) Commission on sales 5% will be paid after 2 months of the sales. (This commission is in addition of Selling Exp.)

2) Machine Costing Rs. 65,000/- will be purchased in the month of April but payment will be done in the month of August.

3) Dividend of last year Rs. 15,000/- will be paid in the month of July.

4) Lag time allowed to customers for the payment is 2 months, and 2 months credit period allowed from suppliers.

Also write down the steps to perform above operation in MS-EXCEL.

A28. Budgeted information given as under :-

Month	Sales	Purchases	Wages Exp.	Manu. Exp.	Office Exp.	Selling
Mar.	50,000	30,000	5,000	1,000	1,000	6,000
April	60,000	35,000	6,000	4,000	2,000	7,000
May	70,000	37,000	7,000	2,000	3,000	8,000
June	80,000	42,000	8,000	4,000	3,000	9,000
July	90,000	60,000	9,000	3,000	2,000	15,000
Aug	1,00,000	70,000	11,000	4,000	1,000	20,000

Additional Information :-

1) Cash balance on 1st may Rs. 80,000/-

2) 20% sales in cash & out of total Credit sales 50% amount Recovered in the following month & balances 50% in the next month of the following month.

3) Suppliers allowed a credit period of 2 months.

4) Lag time for wages 1/2 month.

5) Delay in payment of office expenses 1 month.

6) Delay in payment of manufacturing exp. 1 month.

7)Amount of shares call money willbe received in the months of mayRs. 50,000/-

8) Payment of tax will be done in July Rs. 80,000/-.

9) Machine will be purchased in June Rs. 20,000/-.

Prepare Cash Budget for May, June, & July.

Also write down the steps to perform above operation in MS-EXCEL.

A29. A newly established Company wants to prepare Cash budget for four months ending on 30th June.

Month	Sales	Materials	Wages	Overheads	Selling&Admn.Exp
Jan	20,000	20,000	4,000	3,200	800
Feb.	22,000	14,000	4,400	3,300	900
Mar.	24,000	14,000	4,600	3,300	800
Apr.	26,000	12,000	4,600	3,400	900
May	28,000	12,000	4,800	3,500	900
June	30,000	16,000	4,800	3,600	1,000

Adjustment:-

1) Expected Cash balance on 1st March Rs. 10,000/-.

2) A machinery is purchased for Rs. 30,000/- payment will be done in two equal installments March & April.

3) Selling Commission 5% on total sales & this commission will be paid in the following months of actual sales.

4) Amount of 2nd call will be received in the month of marchRs. 10,000/- & Amount of share premium Rs. 2,000/- will be received with 2nd call.

5) Period allowed to customer for payment is1 month.

6) Remaining all other exp. will be paid in the following months.

7) The delay in the payment of wages 1/2 month.

8) You may presume that 50% sales are in cash.

9) Suppliers allowed period of 2 months for payment.

Also write down the steps to perform above operation in MS-EXCEL.

A30.By the help of following information prepare cost sheet for the month of March 1980:

1. Stock (1-3-1980)	
a) Raw Materials	25,000
b) Finished goods	17,360
2. Stock (31-3-1980)	
a) Raw Materials	26,250
b) Finished goods	15,750
3. Raw material purchased	21,900
4. Work-in-progress (1-3-80)	8,220
5. Work-in-progress (31-3-80)	9,100
6. Sale of finished goods	72,310
7. Direct wages	17,150
8. Unproductive Wages	830
9. Factory Expenses	8,340
10. Office and management expenses	3,160
11. Selling and distribution expenses	4,210

Prepare cost sheet and find out following information:

1) Total Cost 2) Cost of goods sold 3) Profit on sold out goods

Also write down the steps to perform above operation in MS-EXCEL.

Paper - II: Programming in C& OOP's Concepts(1T2)

UNIT – I

Design methods, Programming language, Translators, Introduction to C, C character set and keywords, Escape sequence, Constants and variables, Data types, Conversion specification, Input and output statements in C, Operators and expressions (Arithmetic, Relational, Logical, Assignment, Ternary, Bit Wise and Increment & Decrement Operator). **Storage class:** Automatic, Static, External, Register. **Control statement:** If-else, Looping statements (while, do- while and for loop), Switch, Go-to, Use of break and continue statements.

UNIT – II

Function: Arithmetic and string library function, User defined functions, Function definition & declaration, Function call, Return statement, Function arguments, use of void, Types of function, Function with call by value and call by reference, Recursion.

Arrays: Declaration, Referring individual elements, Entering data in to an array, Reading data from array, Array initialization, Printing of array, Searching, Sorting and merging of array. **Pointer:** Introduction to pointer, Pointer and function, pointer and structure, Pointer and array, Pointer and string. **Dynamic memory allocation:**Sizeof ( ), malloc (), calloc ( ), realloc(), free().

UNIT – III

String: String manipulation using string library function, **Structure:** Declaration structure, initializing structure, Structure variables, accessing structure elements, Arrays of structure, Array within structure. **Unions:** Concept and applications. **Files:** Concept of file, Modes of files, Open and close, Creation and reading of files, Character input/output function, Formatted input/output function, String input and output: sscanf, sprint, gets, puts. **File input/output:**fprintf, facanf, getc, putc, and **Block read/write:**fread, fwrite, random access to files, Other file function, command line argument.

UNIT – IV

Introduction to OOP, Characteristics of OOP's, Advantages & disadvantages of OOP's, Steps in developing the OOP Program, Object Oriented Languages, Importance of C++, Classes and objects, Member function, Concept of overloading, Inheritance & types of inheritance, Data abstraction, Data encapsulation, Concept of polymorphism and virtual function, Namespace and exception handling.

Text Books:

1. S. K. Shrivastava&DipaliSrivastava, C in Depth, BPB Publication.
2. D. Ravichandran, Programming with C++, McGraw-Hill.

Reference Books:

1. Steve Oualline, Practical C Programming, SPD, O'Reilly.
2. HarshalArolkar, Simplifying C, Dreamtech Press.
3. Dr. S.Dey&MridulGhosh, Computer Fundamentals and C Programming, SPD.
4. YashwantKanetkar, Let Us C, BPB Publication.
5. Veugopal Prasad, Mastering C, McGraw-Hill.
6. Balguruswamy, Programming in ANSI C, McGraw-Hill.
7. E. Balguruswamy, Object Oriented Programming with C++, McGraw-Hill.

Practical List ofProgramming in C& OOP's Concepts

1. Write an algorithm, draw a flowchart and develop 'C' program to compute the factors of a given number.

2. Write an algorithm, draw a flowchart and develop 'C' program to interchange the values of two numbers without using any temporary variable.

3. Write an algorithm, draw a flowchart and develop 'C' program to calculate and find the nature of roots of given quadratic equation.

4. Write an algorithm, draw a flowchart and develop 'C' program to check given number is prime number.

5. Write an algorithm, draw a flowchart and develop 'C' program to calculate LCM & HCF of two numbers.

6. Write an algorithm, draw a flowchart and develop 'C' program to reverse an n digit number.

7. Write an algorithm, draw a flowchart and develop ‘C’ program to calculate sum of odd digits and product of even digits of a given n digit number.

8. Write an algorithm, draw a flowchart and develop ‘C’ program to check a given number is an Armstrong number.

9. Write an algorithm, draw a flowchart and develop ‘C’ program to convert a decimal number into its equivalent binary number.

10. Write an algorithm, draw a flowchart and develop ‘C’ program to display the Fibonacci series of n terms.

11. Write an algorithm, draw a flowchart and develop ‘C’ program to print the following output:-

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

12. Write an algorithm, draw a flowchart and develop ‘C’ program to display the following pattern;-

```
1      1
1 2        2 1
1 2 3    3 2 1
1 2 3 4 3 2 1
```

13. Write an algorithm, draw a flowchart and develop ‘C’ program to calculate the series of n terms foe x as;-
    $S = x + x^2 + x^3 + x^4 + \ldots\ldots\ldots$

14. Write an algorithm, draw a flowchart and develop ‘C’ program to calculate the sum of the n terms of the series;-
    S= 1/2!+2/3!+3/4!+4/5!.....

15. Write an algorithm, draw a flowchart and develop ‘C’ program to display the following pattern:-

```
                1
          2 3 2
              3 4 5 4 3
            4 5 6 7 6 5 4
          5 6 7 8 9 8 7 6 5
```

16. Write an algorithm, draw a flowchart and develop ‘C’ program to insert an element in an array at appropriate position.

17. Write an algorithm, draw a flowchart and develop ‘C’ program to sort the given array using bubble sort.

18. Write an algorithm, draw a flowchart and develop ‘C’ program to find the transpose of a given matrix.

19. Write an algorithm, draw a flowchart and develop ‘C’ program to check whether the given word is palindrome or not.

20. Write an algorithm, draw a flowchart and develop ‘C’ program to count vowels in given word using switch statement.

21. Write an algorithm, draw a flowchart and develop ‘C’ program to count number of letters, words and blank spaces in a given line.

22. Write an algorithm, draw a flowchart and develop ‘C’ program to find largest and smallest element of given array using function concept.

23. Write an algorithm, draw a flowchart and develop ‘C’ program to find factorial of given number using recursion function.

24. Write an algorithm, draw a flowchart and develop ‘C’ program to find reverse of digits of given number using recursion concept.

25. Write an algorithm, draw a flowchart and develop ‘C’ program to swap the values of two array using user defined function. Use the concept “Call by Value” and “Call by Reference”.

26. Write an algorithm, draw a flowchart and develop ‘C’ program to find and replace a numeric value from an array using function and pointer.

27. Write an algorithm, draw a flowchart and develop ‘C’ program tocreate a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

28. Write an algorithm, draw a flowchart and develop ‘C’ program to create a file “abc.txt” and store the text. Copy the content from “abc.txt” to another file “xyz.txt” using putc() and getc() function. Also read the content of both files.

29. Write an algorithm, draw a flowchart and develop ‘C’ program to write and read the ‘n’ records as an entire block (structure) on a file using fwrite() and fread(). The block structure contains Roll Number and Name of the Students.

30. Write an algorithm, draw a flowchart and develop ‘C’ program to copy the content of one file to another file by using command line argument.

Paper-III: Introduction to Operating Systems(1T3)

UNIT – I

Introduction – What operating systems do, Computer system organization, Computer system architecture, Operating system architecture, Operating system operations, Process management, Memory management, Storage management, Protection & Security, Kernel data structures, Computing environments, Open source operating systems. **System Structures –** Operating system services, User and operating system interface, system calls, types of system calls.

UNIT – II

Process Management –Process concept, Process Scheduling, Operations on processes, Interprocess Communication. Deadlocks – Deadlock characterization, Deadlock prevention, Deadlock Avoidance. **Memory Management Strategies –** Background, Swapping, Contiguous memory Allocation, Segmentation, Paging. **File System –** File concept, File system mounting, File sharing.

UNIT – III

Introduction to Disk Operating System (DOS)

- File types, Directory Structure
- Booting - Warm and Cold Booting
- Types of DOS commands (Internal and External)
- Introduction of Autoexe and Config files.
- Directory commands: DIR, MD, RD, TREE, PATH, SUBST ETC.
- Wild card Definitions
- Commands related to file management: COPY, DEL, ERASE, REN, ATTRIB, XCOPY, BACKUP and RESTORE .
- General commands: TYPE DATE, TIME, PROMPT etc.
- batch commands, wild card characters & its use.

UNIT – IV

Introduction to Unix overview

- File systems and structure of directories and file
- File Oriented Commands – Cat, op, In mv, rm etc.
- File Permissions
- Directory Oriented commands – ls, mkdir, rmdir, cd, pwd etc.
- Inter user connection commands – write, mail, used, at, wall etc.
- Common commands – skill, date, wo, sleep, who ps.
- Unix Utility Commands – grep, pr, cut, paste, sort, lp shutdown, halt, sys, tar, find etc.
- Basics of shell scripts
- Writing shell scripts, running scripts, using variables, controlling the flow of statement
- Introduction of Linux.

Text Books:

1. Abraham Silberschatz, Peter Galvin, Gerg Gagne, Operating System Concepts, Wiley.
2. Robert M. Thomas, DOS 6 & 6.2, BPB Publications.
3. YashavantKanetkar, Unix Shell Programming, BPB Publications.

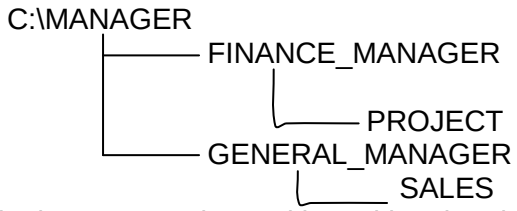
Reference Books:

1. Tanenbaum, Modern Operating Systems, PHI.
2. Stuart E. Madnick, John J. Donovan, Operating Systems, McGraw-Hill.
3. Dhananjay M. Dhamdhere, Operating Systems, McGraw-Hill
4. Sumitabha Das, Unix Concepts & Applications, McGraw-Hill.
5. Kernighan & Pike, The Unix Programming Environment, PHI.
6. Christopher Negus, Ubuntu Linux Toolbox, Wiley.
7. S. Jaiswal, DOS / Unix& Windows: IT Today, Encyclopedia.
8. Burnett, Using Linux: Tackett, PHI.
9. MS-DOS Manual.

Practical List ofIntroduction to Operating Systems

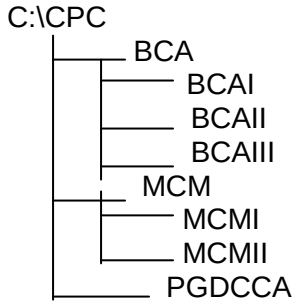
1. Make a directory naming VMV in DOS. Under that make three sub directories BCAI, BCA II, BCAIII. Also explain the commands used in making the directories and subdirectories in DOS.

2. Using Tree Command in DOS make the following tree diagram



   Also explain the commands used in making the above tree diagram.

3. Using tree command in DOS makes the following tree diagram



   Also explain the commands used in making the above tree diagram.

4. Make a file named "compute.txt" in DOS and write the definition and characteristics of computer in that file. Rename the file compute.txt to computer.txt.
   Also explain the commands used in making the file and renaming file. Explain the difference between copy and ren Command.

5. Make a file named "compute.txt" in DOS and write the definition and characteristics of computer in that file.Copy the contents of file compute.txtto computer.txt.Also explain the commands used in making the file and copying the contents of one file to another file.

6. Make a file named file1.txt in DOS and enter the following text in that file.
   WWW can be defined as a set of standards for storing, retrieving, formatting and displaying information using client/server architecture, graphical user interfaces and a hypertext language that enables dynamic link to documents. World Wide Web is a repository of information spread all over the world and linked together.

7. Write a shell script in UNIX to calculate area of a triangle.

8. Write a shell script in UNIX to calculate area and circumference of a circle.

9. Write a shell script in UNIX to calculate the simple interest.

10. Write a shell script in UNIX to calculate the total marks and percentage of five subjects.

11. Write a shell script in UNIX to calculate largest and smallest number among three numbers.

12. Write a shell script in UNIX to calculate the gross salary of an employee. The salary includes – Basic Salary, HRA (20% of Basic Salary), DA (20% of Basic Salary) and CCA (10% of Basic Salary).

13. Write a shell script in UNIX to enter the two strings and then compare the two strings. If strings are equal then display the message “Strings are Equal” else “Strings are not Equal”.

14. Write a shell script in UNIX to check whether the given file is directory or ordinary file.

15. Write a shell script in UNIX to check entered character is in uppercase or in lowercase.

16. Write a shell script in UNIX to check whether the entered number is EVEN or ODD.

17. Write a shell script in UNIX to check whether the entered number is prime or not.

18. Write a shell script in UNIX to print the Fibonacci series.

19. Write a shell script in UNIX to calculate the factorial of a given number.

20. Write a shell script in UNIX to calculate reverse a number.

21. Write a shell script in UNIX to find sum of digits of a number.

22. Write a shell script in UNIX to implement Break statement.

23. Write a shell script in UNIX tosearch whether element is present is in the list or not.

24. Write a shell script in UNIX to copy contents of one file to another.

25. Write a shell script in UNIX to count number of files in a directory.

26. Write a shell script in UNIX to implement FCFS Algorithm.

Paper - IV: Computerized Accounting (TALLY ERP 9)(1T4)

UNIT - I

Accounting Basics -Defining the need for accounting, Defining accounting, Exploring the branches of accounting, Describing the functions of accounting, Listing the advantages of accounting, Listing the limitations of accounting, Explaining important terms in accounting, Exploring the concepts of accounting, Understanding the conversions of accounting, Describing an account and its types, Explaining the rules of debit and credit, Describing a journal, Describing a ledger, Describing trial balance, Describing a financial entries, Understanding adjustment entries.

Introduction to Tally.ERP 9 – Features of Tally, Enhancement in Tally.ERP 9, Installation procedure of Tally.ERP 9, Opening Tally.ERP 9, Components of the Tally.ERP 9 window, creating a Company.

UNIT - II

Stock and Godown in Tally.ERP 9 –Stock groups, Stock categories, Stock items, Units of measure, Godowns.**Group, Ledgers, Vouchers and Orders –** Introducing groups, Introducing ledgers, Introducing vouchers, Introducing purchase orders, Introducing a sales order, Introducing invoices.

UNIT - III

Reports in Tally.ERP 9 – Working with balance sheet, Working with profit & loss A/c report, Working with stock summary report, Understanding ratio analysis, Working with trial balance report, Working with day book report. **Payroll –** Exploring payroll in Tally.ERP 9, Required features to create a pay slip, Description of payroll info, Working with payroll vouchers, Defining payroll reports, working with statements of payroll report, Describing salary discursement.

UNIT - IV

Taxation – Indian Tax Structure, Tax deducted at source in tally.ERP 9, Create a Tax Ledger, TDS Vouchers, Printing a TDS Challan, Tax collected at source in Tally.ERP 9, TCS reports in Tally.ERP 9, Calculating VAT in Tally.ERP 9, VAT Classification, VAT Vouchers, VAT Reports in Tally.ERP 9, Service Tax.

Text Book:

1. Vikas Gupta, Business Accounting with MS Excel andTally.ERP 9 Course Kit, Dreamtech Press.

Reference Books:

1. Computerized Accounting using Tally ERP 9, Sahaj Enterprise, Tally Education Private Ltd (TEPL).
2. Vishnu Priya Singh, Tally 9.
3. K. K. Nadhani, Accounting with Tally, BPB Publication.
4. K. K. Nadhani and A.K. Nadhani, Tally Tutorial, BPB Publication.
5. Anthony R. N. and J. S. Richard, Accounting Principles, Irwin Inc.

Practical List ofComputerized Accounting (TALLY ERP 9)

1. Create a company in Tally ERP 9 with the following details:

Name of company	Universal Company Ltd.
Address	1804, world Tower, AB road, Baner, Pune _411080
Country	India
State	Maharashtra
Contact number	7894561230
Mobile number	7741258963
Email-Id	info@universalmfg.co.in
Books beginning from	01-04-2015
Financial year Beginning from	01-04-2015

2. Create a company in Tally ERP 9 with the following details:

Name of company	Sambhav trading Company
Address	a/512, palm court, girgaamchaupaty, charni road, Mumbai-400007
Country	India
State	Maharashtra
Contact number	022-22886512
Mobile number	9898745555
Email-Id	enquiry@sambhav.com
Books beginning from	01-04-2014
Financial year Beginning from	01-04-2014

3. Create the following ledgers in the books of universal company ltd in Tally ERP9.

Name of ledger	**Under (group)**	**Bill wise details set to**	**Opening balance**
Share capital	Capital account	No	15,00,000
Purchase account	Purchase account	No	Nil
Sales accounts	Sales accounts	No	Nil
Ultra tech cement ltd	Sundry creditors	yes	270000
Building	Fixed assets	No	1200000
Computers	Fixed assets	No	50000
Office furniture	Fixed assets	No	175000
Cash in hand	Cash accounts	No	20000
Civic centre association	Sundry debtors	yes	290000
Bank of india	Bank accounts	No	80000
Petty cash	Cash in hand	No	50000

4. **Create the following ledgers in the books of universal company ltd in Tally ERP 9.**

Name of ledger	Under (group)	Bill wise details set to	Opening balance
ProprietorsCapital	Capital Account	No	10,00,000
Purchase Account	Purchase Account	No	Nil
Sales Accounts	Sales Accounts	No	Nil
Hindustan Lever Ltd	Sundry creditors	yes	355000
Land and Building	Fixed Assets	No	850000
Computers and Peripheral	Fixed Assets	No	30000
Office Furniture	Fixed Assets	No	75000
Cash in hand	Cash Accounts	No	18000
Tahuraa Traders PvtLtd	Sundry Debtors	yes	310000
Bank of Baroda	Bank Accounts	No	102000

5. **Record the following vouchers in the books of Universal company ltd.**
   a. 04-04-2014 withdrawn Rs. 20000 from bank of india and transferred to petty cash book.
   b. 08-04-2014 paid 2000 from petty cash for buying stationery for office.
   c. 15-04-2014 made purchase from ultra tech cement ltd. Worth Rs. 45000
   d. 19-04-2014 issued cheque to ultra tech cement ltd for Rs. 45000
   e. 21-04-2014 sold goods worth of Rs. 75000 to civic centre association
   f. 25-04-2014 received a cheque from civic center association for Rs. 75000. The same was deposited in the bank on the same date.
   g. 30-04-2014 paid staff salary of Rs. 9800 from petty cash

6. **Record the following vouchers in the books of Sambhav Trading Co. Pvt. ltd.**
   a. 02-04-2014 withdrawn RS. 10000 From bank of barodaand transeferred to petty cash book.
   b. 05-04-2014 paid 1000 from petty cash for office expenses.
   c. 11-04-2014 made purchase from Hindustan unilever ltd. Worth Rs. 33000
   d. 13-04-2014 Issued cheque to Hindustan Unilever Ltd. For Rs. 20000
   e. 14-04-2014 Made purchase from Hindustan Unilever Ltd. Worth Rs. 26000
   f. 18-04-2014 Issued cheque of Rs. 38000 to Hindustan Unilever Ltd.
   g. 21-04-2014 sold goods worth of Rs. 90000 to Tahuraa Traders Pvt Ltd.
   h. 22-04-2014 received a cheque from Tahuraa Traders Pvt Ltd. For Rs. 75000 . The same was deposited in the bank on the same date.
   i. 23-04-2014 sold goods worth of rs. 85000 to Tahuraa Traders Pvt Ltd.
   j. 25-04-2014 receivedcheque from Tahuraa Traders Pvt Ltd. From Rs.75000. The same was deposited in the bank on the same date.
   k. 30-04-2014 Paid staff salary of Rs. 7200 from petty cash.

7. **Create cost centers Project A and Project B under primary cost category and record the following transaction in the books of sambhav trading company**
   a. On 07-09-2014, purchased Cement worth Rs. 1, 50,000/- fromUltratech cement Ltd. That will be shared equally between Project A and Project B. A credit period of 30 days was provided.

b. Record transaction on 09-09-2014 for the purchase of Steelworth Rs. 450000 fromEmbee Enterprises. Allocate Rs. 50000 to Project A and the the rest to Project B . a credit period of 45 days was allowed .

8. Create cost centers Mumbai and Pune under primary cost category and record the following transaction in the books of Universal co. Limited

a. On 05-10-2014, purchases done worth Rs. 2, 50,000/- from Hindustan Unilever Ltd. That will be shared equally between Mumbai and Pune.
b. Record transaction on 09-10-2014 for the purchase worth Rs. 600000 from Hindustan Unilever Ltd. Allocate Rs. 250000 to Mumbai and the rest to Pune. . a credit period of 45 days was allowed.
c. On 18-10-2014 record a transaction for the sale on Super technologies for Rs. 1575000/- of which 1200000 would be allocated to Mumbai branch and the rest to Pune.
d. On 22-10-2014 one more sales entry was made for 1600000 to Super technologies of which 10,00,000 was allocated to pune branch and the rest to Mumbai.

9. Record the following transaction in the books of Universal Co. Ltd.

a. On May 11, 2014 they received a bill no. May /005/2014 for a sum of Rs. 125000/- from M/s. Rajesh shah and Co., architects for consultancy towards designing their office and trainingcentre.
b. Universal company Ltd. Made the payment after deducting the TDS amount.
c. On 27th May 2014,company received bills no May/015/2014 for a sum of Rs. 75000 from M/s Rajesh shah and co., architects for consultancy.
d. On 28thMay, company made the payment after deducting TDS.

10. Journalize the following Transaction in the books of Mr. Anil for the month of March 2012 and prepare Trial balance

March 2010	Particular			Amt	
1	Start business with cash			80000	
3	Purchase goods for cash				5000
4	Purchase goods from Akash				9000
6	Sold goods to Vikas		7000		
7	Return goods to Akash	700			
9	Goods return by Vikash				400
11	Cash paid to Raman			4000	
17	Withdrew from Bank		10000		
20	Wage paid				1000

11. Akhileshstarted his business on 1st Jan. 2012 with Rs.5000, his transaction for the month were as following, prepare Cash A/C.

January 2012	Particular	Amt
1	Bought goods on credit from Sachine& Sons	5000
5	Paid salary	500
10	Sold to Roy	2000
15	Cash sales	2200
19	Cash Purchase	3000
25	Deposit in Bank	1000
27	Goods returned to Sachine& Sons	500
31	Cash Withdrawn by Akhilesh for personal use	500

12. Journalize the following transactions in the books of Sudhir Kumar 2003 and prepare a Trial Balance :

Jan 2003	Particular	Amt	
1	Sudhir Commenced business with cash		40000
3	Purchased goods for cash		500
5	Sold goods for cash	300	
6	Purchased one Motor Car for cash	15000	
9	Sold Machinery for cash	9000	
11	Purchased a Building on credit from Narendra	20000	
15	Sold Furniture on credit to RandhirKappor	9500	
17	Paid Cartage	110	
22	Received Commission		50
27	Cash Sales		1200
29	Cash Purchase		600
30	Received on account from Ahmed		350
31	Paid cash to Sunitkumar on account	190	

13. Journalize the following transactions in the books of Royal & Co. and prepare a Trial Balance :

Nov. 2003	Particular	Amt	
1	Cash invested in Business		150000
2	Cash deposited In to SBI Current A/C	30000	
3	Goods Purchased in cash	20000	
4	Goods Sold in cash		12000
5	Commission received Rs. 500 from Sushma Traders		
6	Goods Sold on credit to Roshan	25000	
7	Goods return from Roshan	5000	
8	Depreciation charged on Machine @ 12% for four month Machine Cost 45000		
10	Cheque received from Roshan	10000	
11	Salary Paid	1500	

14. Journalize the following transaction in the books of Sanjay Potdarfor the month of March 2012.

1. Ashok starts business with Rs. 100000/-
2. Purchase machinery for Rs. 50000/ and furniture for Rs. 10000
3. Paid amount for rent Rs. 1000/
4. Deposits Rs,. 10000/- in Bank
5. Purchase of goods for Rs. 20000/ from Mr. Ram on credit.
6. Sold goods to Mr. Rakesh for Rs. 10000/
7. Rs. 5000/ withdraws from bank for personal use.
8. Withdraws Rs. 1000/ for office use.
9. Received cash from Mr. Rakesh.
10. Paid to Mr. Ram.

15. Record the following transaction in the books of Raj enterprises.

1. Goods purchase from “Kirti sales” on credit Bill no. 115 Rs. 62000
   a. Color tv (Lg) 4% 3qty Rs. 30000
   b. Washing machine (samsung) 4% 4 qtyRs. 32000
2. Cash received from sangamenterprisesRs. 15000
3. Goods purchase in cash bill no. 69 Rs. 35000
   a. B/W tv (sony) 4% 4 qtyRs. 20000
   b. Audio (onida) 4% 5 qtyRs. 15000
4. Goods sale on cash rs, 19000
   a. Color tv (lg) 4% 1 qtyRs. 15500

b. Audeo (onida) 4% 1 qtyRs. 3500

5. Goods purchase in cash from vikram enterprises bill no. 45 Rs. 40000
   a. Color tv (Lg) 4% 2 qtyRs. 20000
   b. Refrigerator (Videocon) 4% 2qty Rs. 20000
6. Cheaque no. received from ravi agency Rs. 10000 and deposited in state bank.
7. Credit sale to vijay enterprises bill no. 93 Rs.17200
   a. Washing machine (samsung) 4% 1qty Rs. 8000
   b. B/W tv (sony) 4% 1 QtyRs. 5700
   c. Audio (onida) 4% 1 qtyRs. 3500
8. Cash paid to ravikulkarnirs. 1500
9. Cheque no. 159 paid to central engineering co. Rs 15000
10. Refrigerator purchase on cash Rs. 30000 form k k agency 3 qty (Videocon) 4%
11. Office rent paid in cash Rs. 1700
12. Received cheque from vijay enterprises Rs. 10000 & deposited in canara bank.
13. Bill received from lokmatRs. 1500 bill no.5
14. Amount received from vaishali agency in cash rs. 5000 &cheque no. 336791 Rs. 10000 only. Cheque deposited in state bank.
15. Cash sale to telco ltd. Rs. 29900
    a. Color tv (Lg) 4% 1 qtyRs. 10000
    b. Washing machine (Samsung) 4% 1 qtyRs. 9100
    c. Refrigerator (Videocon) 4% 1qty Rs. 10800
16. Cheque deposited in canara bank Rs.5000
17. Cash withdrawn from bank Rs. 34000

16. Record the following transaction in the books of Maharashtra Traders.

1. Opening stock for WadiGodown
   a. Akai color Tv 4% 10 qty Rs.10500 each.
   b. Refrigerator (Videocon) 7qty 12000 each.
   c. Washing machine (samsung) 5 qty 8000 each
   d. Audio (Philips) 4% 2Qty 2000
   e. Onida color tv 4% 5 qty 12000 each
   f. B/W tv (akai) 4% 5 qty 18000

2. Opening stock for nandanwangodown
   a. Akai color tv 2 qty 10500 each
   b. refrigerator (Videocon) 3qty 12000 each
   c. Audio (Philips) 3 qty 1000 each.
3. Cash sale to Bhagwandas Co. Rs. 41500 in wadigodown.
   a. Color tv (akai) 4% 2qty Rs.21000.
   b. Refrigerator (Videocon) 4% 1qty Rs. 11300
   c. Washing Machine (samsung) 4% 1qtyRs. 9200.
4. Goods purchase in cash from national Trading co. & store Nandanwangodown.
   a. Audio (Philips) 2qty 4% Rs.6000
   b. W/M (Samsung) 1qty 4% Rs. 10000
5. Credit sales to Ravina traders Rs. 51800 wadigodown.
   a. Refrigerator (Videocon) 2qty 4% Rs. 22000.
   b. W/M (Samsung) 1qty 4% Rs.8300
   c. Color tv (akai) 2qty 4% 21500
6. Cheque received from vikasenterprises Rs. 20000 &deposited in state bank.
7. Cash withdrawn from state bank cheque no. 16 Rs. 15000/-

8. Received loan from state bank Rs. 10,00,000/- invested in business, interest 10%.
9. Cheque paid to kirti sales rs. 25000/-
10. Goods purchase oncredit fromrama& sons Rs. 44000 store nandanwan.
    a. W/M (Lg) 3 qty 4% Rs. 24000
    b. Refrigerator (Videocon) 1qty 4% Rs. 10000.
    c. Color tv (onida) 1qty 45 Rs. 10000
11. Akai color TV purchase in cash Rs. 20000 2qty 4% Rao store in nandanwan.
12. Paid salary Rs. 10000
13. Paid bank loan Rs. 8,00,000
14. Cash sale on wadigodownRs 42000\
    a. Audio 2 qty 4% Rs.7000
    b. w/m (s.s.) 2qty 4% Rs. 17000
    c. b/w tv (akai) 3qty 4% Rs. 18000
15. Paid to rama& sons by chequeRs. 18000 chq. No. 1152.
16. Paid electric bill Rs. 10000
17. Total cash sale after allowing discount Rs. 1000.
18. Paid total balance loan on state bank.
19. Advertisement exp. Rs.10000
20. Carriage exp. Rs. 5000
21. Purchase furniture for nandanwangodown Rs.28000 in cash.
22. Withdrawn for personal use Rs, 10000.

17. Record the following transaction in the books of Rathore Traders.

1. Goods purchase from sohan& sons Rs. 20000/-
    a. Gold 10gm (12.5%) rs. 10000/-
    b. Silver 1kg (12.5%) Rs.10000/-
2. Goods purchase from sagar computer Rs. 25000/-
    a. Monitor (compaq) 1qty 5000/- 4%
    b. Cpu (intel) 1qty 15000/- 4%
    c. Speaker (Logitec) 1qty 5000/- each
3. Goods sold on cash Rs. 22000/-
    a. Gold (12.5%) 10gm 12000/-
    b. Silver(12.5%) 1kg 10000/-
4. Withdrawn 400/- Rs. From canara bank.
5. Cash given to sagar computers Rs. 24000/- in full settlement.
6. Cheque given to mr.sohan& sons. Rs 20000.
7. Salary given to mr.sahilRs. 2000/-
8. Withdrawn Rs. 4000/-
9. Paid insurance premium Rs. 200/-
10. Purchase table without vat Rs.2000/-

MCM Part-I

Semester-II

Paper - I: Management Information Systems (2T1)

UNIT - I

Strategic View of MIS:

Management information system in a digital firm: Management Information System (MIS): Concept, Definition, Role of MIS, Impact of the MIS, MIS and the user, Management as a control system, MIS: A support to the management, Management effectiveness and MIS, Organization as a System, MIS: Organization Effectiveness, MIS for a digital firm. **E-Business Enterprise:** A digital firm - Introduction, Organization of business in a digital firm, E-Business, E-Commerce, E-Communication, E-Collaboration, Real Time Enterprise.

Strategic Management Of Business Performance: Concept of corporate planning, Essentiality of strategic planning, Development of the business strategies, Types of strategies, Short range planning, Tools of planning, Strategic analysis of business, Balance score card, Score card and dash board, MIS: Strategic business planning.

Information security challenges in E-Enterprises: Introduction, Security threats and vulnerability, controlling security threats and vulnerability, managing security threat in E-Business, Disaster management, Information security.

UNIT - II

Basic of Management Information Systems:

Decision-Making: Concept, Process, Decision analysis by analytical modeling, **Behavioral concepts in Decision -** Making, Organizational Decision Making. **Information, Knowledge, Business Intelligence:** Information concepts, Information: A quality product, Classification of the information, Methods of data and information collection, Value of the information, General model of a human as an information processor, Summary of information concept and their implications, Knowledge and knowledge management systems, Business intelligence MIS and the information and knowledge. **System Engineering: Analysis And Design:** System concepts, System control, Types of system, Handling system complexity, Classes of systems, General model of MIS, The need for system analysis, System analysis of the existing system, System analysis of a new requirement, System development model, Structured system analysis and design (SSAD), Object oriented analysis (OOA), System development through OOT: A use case model, OOSAD development life cycle.

UNIT – III

Development process of MIS: Development of long range plans of the MIS, Ascertaining the class of information, Determining the information requirement, Development and implementation of the MIS, Management of information quality in MIS, Organization for development of MIS, MIS: Development Process Model. **Strategic Design of MIS:** Strategic management of the business, Why strategic design of MIS?, Balance score card, Score card, and dash board, Strategic design of MIS, Development process steps for strategic design(SD) of MIS, illustrating SD of MIS for Big Bazaar, Strategic management of business and SD of MIS, Business strategy determination, Business strategy implementation. **Business Process Re-Engineering (BPR):**Introduction, Business process, Process model of organization, Value stream

model of the organization, what delays the Business Process? Relevance of information technology (IT), MIS and BPR.

UNIT - IV

Applications of Management Information Systems to E-Business:

Application in manufacturing sector: Introduction, Personnel management (PM), financial management (FM), Production management (PM), Raw material management (RMM), Marketing management, Corporate overview. **Application in Service Sector:** Introduction to service sector, Creating a distinctive service, Service concept, Service process cycle and analysis, Customer service design, Service management system , MIS application in service industry, MIS: Service industry. **Decision support systems and knowledge management:Decision support systems (DSS):** Concept and philosophy, Group decision support system(GDSS), DSS application in E-Enterprise, Knowledge management , Knowledge management systems, Knowledge based expert system (KBES), MIS and the benefits of DSS. **Enterprise Management Systems:** Enterprise management systems(Ems), Enterprise resource planning (ERP) system, ERP models and modules, Benefits of the ERP, ERP product evaluation, ERP implementation, Supply chain management (SCM), Information management in SCM, Customer relationship management (CRM), EMS and MIS.

Text Book:

1. Waman S. Jawadekar, Management Information Systems, McGraw-Hill.

Reference Books:

1. D. P. Goyal, Management Information Systems, Vikas Publishing.
2. D. P. Nagpal, Management Information Systems, S. Chand.
3. S. Sadagopan, Management Information Systems, PHI.
4. A. K. Gupta, Management Information Systems, S. Chand.
5. Mahesh Halale, Management Information Systems, Himalaya publishing house.
6. Kanter, Managing with Information, PHI.

Paper - II: Core Java (2T2)

UNIT - I

Java Evolution - Java history, Java features, How java differ from C and C++, Java and internet, Java and world wide web, Web browsers, Hardware and software requirements, Java support systems, Java environment. **Overview of Java Language** – Introduction, Simple Java programs, More of Java, An application with two classes, Java program structure, Java tokens, Java statements, Implementing a Java program, Java virtual machine, Command line arguments, Programming style. **Constants, Variables, and Data Types** – Introduction, Constants, Variables, Data Types, Declaration of variables, Giving value to variables, Scope of variables, Symbolic constants, Type casting, Getting values of variables, Standards default values. **Operators and Expressions** - Introduction, Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and decrement operators, Conditional operators, Bitwise operators, Special operators, Arithmetic expression, Evaluation of expression, Precedence of arithmetic operators, Type conversion in expression, Operator precedence and associativity, Mathematical functions. **Decision Making and Branching** – Introduction, Decision making with If Statement, Simple If statement, The If…Else statement, Nesting of If...Else statement, The Else If ladder, The switch statement, The? : Operators. **Decision Making and Looping** – Introduction, The while statement, The do statement, The for statement, Jumps in loops, Labeled loops.

UNIT - II

Classes, Objects and Methods – Introduction, Defining a class, Fields declaration, Methods declaration, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods, Inheritance: Extending a class, Overriding methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes, Methods with varargs, Visibility Controls. **Arrays, Strings and Vectors** – Introduction, One-Dimensional Array, Creating an array, Two-Dimensional Array, Strings, Vectors, Wrappers classes, Enumerated types, Annotations. **Interfaces: Multiple Inheritance** – Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface variables.

UNIT - III

Packages: Putting Classes Together – Introduction, Java API Packages, Using system packages, Naming conventions, Creating packages, Accessing a package, Using a package, Adding a class to package, Hiding classes, Static import. **Multi Threaded Programming** – Introduction, Creating threads, Extending the thread class, Stopping and blocking a thread, Life cycle of thread, Using thread methods, Thread exception, Thread priority, Implementing the 'Runnable' interface, Inter-thread communication. **Managing Errors and Exceptions** – Introduction, Types of errors, Exceptions, Syntax of exceptions handling code, Multiple catch statements, Using finally statements, Throwing our own exceptions, Improved exception handling in Java ES 7, Using exceptions for debugging.

UNIT - IV

Applet Programming – Introduction, How applet differ from application, Preparing to write applet, Building applet code, Applet life cycle, Creating an executable applet, Designing a web page, Applet tag, Adding applet to HTML file, Running the applet, More about applet tag, Passing parameters to applet, Aligning the display, More about HTML

tags, Displaying numerical values, Getting input from the user, Event handling. **Graphics Programming** – Introduction, The graphics class, Lines and rectangles, Circles and ellipses, drawing arcs, Drawing polygons, Line graphs, Using controls loops in applets, Drawing bar charts, Introduction to AWT packages, Introduction to swing. **Managing Input / Output Files in JAVA** – Introduction, Concepts of streams, Streams classes, Bytes streams classes, Character streams classes, Using streams, Other useful I/O classes, Using the file classes, Input / Output exception, Creation of files, Reading/Writing character, Reading/Writing bytes, Handling primitive data types, Concatenating and buffering files, Random access file, Interactive input and output, Other stream classes. **JAVA Collections** – Introduction, Overview of interfaces, Overview of classes, Overview of algorithm.

Text Book:

1. E. Balagurusamy, Programming with Java, McGraw-Hill.

Reference Books:

1. Dr. R. NageswaraRao, Core Java – An Integrated Approach, Dreamtech Press.
2. RashmiKanta Das, Core Java for Beginners, Vikas Publishing.
3. Joel Murach, Murach's Java Programming, ShroffPubishers.
4. SharanamShah &Vaishali Shah, Core Java 8 for Begineers, ShroffPubishers.
5. Patrick Naughton& Herbert Schildt, JAVA 2 – The Complete Reference 3/E, McGraw-Hill.
6. B. M. Harwani, Java for Professionals, ShroffPubishers.

Practical List ofCore Java

1. Write an algorithm, draw a flowchart and develop a Java program to find the sum of any number of integers entered as command line arguments.

2. Write an algorithm, draw a flowchart and develop a Java program to perform addition, subtraction, multiplication and division using switch case statement.

3. Write an algorithm, draw a flowchart and develop a Java program to find the factorial of a given number.

4. Write an algorithm, draw a flowchart and develop a Java program to display the following pattern –

```
        *
      * * *
    * * * * *
  * * * * * * *
```

5. Write an algorithm, draw a flowchart and develop a Java program to learn use of single dimensional array by defining the array dynamically.

6. Write an algorithm, draw a flowchart and develop a Java program to convert a decimal number to binary number.

7. Write an algorithm, draw a flowchart and develop a Java program to find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument.

8. Write an algorithm, draw a flowchart and develop a Java program to Write a program that show working of different functions of String and StringBufferclasss like setCharAt(, setLength(), append(), insert(), concat()and equals().

9. Write an algorithm, draw a flowchart and develop a Java program to create a - distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer.

10. Write an algorithm, draw a flowchart and develop a Java program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions(from lower to higher data type).

11. Write an algorithm, draw a flowchart and develop a Java program to show the use of static functions and to pass variable length arguments in a function.

12. Write an algorithm, draw a flowchart and develop a Java program to demonstrate the concept of boxing and unboxing.

13. Write an algorithm, draw a flowchart and develop a Java program to find the area of rectangle using constructor.

14. Write an algorithm, draw a flowchart and develop a Java program to demonstrate the method overloading concept.

15. Write an algorithm, draw a flowchart and develop a Java program to find even, odd, factorial of a number using inheritance.

16. Write an algorithm, draw a flowchart and develop a Java program to demonstrate the Interfaces.

17. Write an algorithm, draw a flowchart and develop a Java program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate Fibonacci series is given in a different file belonging to the same package.

18. Write an algorithm, draw a flowchart and develop a Java program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages.

19. Write an algorithm, draw a flowchart and develop a Java program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).

20. Write an algorithm, draw a flowchart and develop a Java program to implement the concept of loading & displaying images.

21. Write an algorithm, draw a flowchart and develop a Java program to demonstrate the animation.

22. Write an algorithm, draw a flowchart and develop a Java program to demonstrate multithread communication by implementing synchronization among threads (Hint: you can implement a simple producer and consumer problem).

23. Write an algorithm, draw a flowchart and develop a Java program to create URL object, create a URLConnection using the openConnection() method and then use it examine the different components of the URLand content.

24. Write an algorithm, draw a flowchart and develop a Java program to implement a simple datagram client and server in which a message that is typed into the server window is sent to the client side where it is displayed.

25. Write an algorithm, draw a flowchart and develop a Java program that creates a Banner and then creates a thread to scrolls the message in the banner from left to right across the applet‘s window.

26. Write an algorithm, draw a flowchart and develop a Java program to get the URL/location of code (i.e. java code) and document(i.e. html file).

27. Write an algorithm, draw a flowchart and develop a Java program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().

28. Write an algorithm, draw a flowchart and develop a Java program to demonstrate different keyboard handling events.

29. Write an algorithm, draw a flowchart and develop a Java program to generate a window without an applet window using main() function.

30. Write an algorithm, draw a flowchart and develop a Java program to display the following output using applet -

    A
    A P
    A P P
    A P P L
    A P P L E
    A P P L E T

Paper - III: Quantity Techniques & Operation Research(2T3)

UNIT - I

Introduction to statistics - Origin and growth of statistics, meaning of statistics, Definitions of statistics, Characteristics of statistics, Main division of statistics, Nature of statistics: a Science or an Art, Scope of statistics , relation of statistics to other sciences, Function of statistics, Importance of statistics, Limitations of statistics, Distrust Misuse of statistics, Statistical thinking, statistical inferences. **Measures of central Tendency or Averages -** Definition and meaning of average, Qualities of good average, Types of averages, Arithmetic mean, median, Mode, geometric mean ,harmonic mean, Relation among mean ,median and mode, Relation among arithmetic mean, geometric mean and harmonic mean, Quartiles ,deciles, and percentiles. **Measures of dispersion-** Definition of dispersion , meaning of dispersion , purpose of dispersion, quartiles of a good Measures of dispersion, Measures of dispersion, range, quartile deviation or semi-inter quartile range, mean deviation or average deviation, standard deviation or root-mean square deviation, co-efficient of variation, variance, combined standard deviation, relation among quartile deviation, mean deviation and standard deviation, Lorenz curve—graphical presentation of dispersion.

UNIT - II

Correlation Analysis - Meaning of correlation, definition of correlation, usefulness of correlation analysis, types of correlation, co-efficient of correlation , measurement of correlation, probable error of co-efficient of correlation, standard error of co-efficient of correlation, co-efficient of determination, correlation ratio. **Regression Analysis -** Introduction, meaning of regression, definition of Regression, usefulness of Regression analysis, types of Regression, Regression lines, Regression equation, Regression co-

efficient, standard error of estimate (SEE), ratio of variation, Galton graph, limitations of Regression analysis, distinguish between correlation and Regression. **Probability Analysis -** Introduction, meaning of Probability, properties of Probability, importance of Probability, Probability related events, theorems of Probability, fundamental rules of Probability, calculation of Probability.

UNIT - III

Operation Research: An Introduction – Operation Research – Quantitative approach to decision making, The history of Operation Research, Definition of Operation Research, Characteristics of Operation Research approach, Applications of Operation Research, Computer software for Operation Research.**Linear Programming: Application & Model Formulation –** Introduction, Structure of linear programming model, Advantage of using linear programming, Limitations of linear programming, Application areas of linear programming, General mathematical model of linear programming problem, Guidelines on linear programming model formulation, Example of linear programming model formulation. **Linear Programming: The Graphical Method –** Introduction, Important definitions, Graphical solution methods of LP problem. **Linear Programming: The Simplex Method –** Introduction, Standard form of an LP problem, Simplex algorithm (Maximization & Minimization Case), Types of linear programming solutions.

Transportation Problem – Introduction, Mathematical model of transportation problem, Methods of finding initial solution. **Assignment Problem –** Introduction, Mathematical model of statement assignment problem, Solution methods of assignment problem (Hungarian Method).

UNIT - IV

Decision Theory and Decision Trees – Introduction, Steps of decision making process, Types of decision making environments, Decision making under uncertainty, Decision making under risk, Decision trees analysis, Decision making with utilities. **Theory of Games -** Introduction, Two Person zero sum games, Pure strategies (Minimax and minimum principles): games with saddle point, Mixed strategies: game without saddle point, the rules of dominance, Solution methods for games without saddle point. **Project management: PERT and CPM –**Introduction, Basic difference between PERT and CPM, Phases of project management, PERT/CPM network components and precedence relationships, Critical path analysis, Project scheduling with uncertain activity times, Project time-cost trade-off, Updating of the project progress.**Replacement and Maintenance Models –**Introduction, Types of failure, Replacement of items whose efficiency deteriorates with time, Replacement of items that fail completely, Other replacement problems.

Text Book:

1. E. Narayanan Nadar, Statistics, PHI.
2. J. K. Sharma, Operation Research – Theory & applications, Macmillan.

Reference Books:

1. P. N. Arora, S. Arora, Statistics, S. Chand.
2. Richard A. Johnson &Gouri K. Bhattavharyya, Statistics – Principles and Methods, Wiley.
3. S. C. Gupta, V. K. kapoor, Fundamentas of Mathematical Statistics, S. Chad & Sons.

4. Ken Black, Applied Business Statistics, Wiley.
5. Ravindran, Phillips & Solberg, Operation Research – Principles & Practice, Wiley.
6. R. Panneerselvam, Operations Research, PHI.
7. Prem Kumar Gupta, D. S. Hira, Operations Research, S. Chand.

Paper - IV: E-Commerce & Web Designing(2T4)

UNIT - I

Introduction- Electronic Commerce And Physical Commerce, The DIGITAL Phenomenon, Looking At E-Commerce From Different Perspectives, Different Types Of E-Commerce, Some E-Commerce Scenarios, Changes Brought By E-Commerce, Advantages Of E-Commerce, Myths About E-Commerce Development And Implementation, System Model And Road Map Of This Book. **Internet And World Wide Web-** An Overview Of The Internet, Brief History Of The Web, Web System Architecture, Uniform Resource Locator, Overview Of The Hypertext Transfer Protocol, Hypertext Transfer Protocol (HTTP), Generation Of Dynamic Web Pages, Cookies, HTTP/1.1, Example. **Client Side Programming**- Important Factors In Client-Side Or Web Programming, Web Page Design And Production, Overview Of HTML, Basic Structure Of An HTML Document, Basic Text Formatting, Links, Images, ImageMap, Tables, Frames, Form, Cascading Style Sheets, Javascript.

UNIT - II

Server-Side Programming I: Servlet Fundamentals- Revisiting The Tree-Tier Model, Common Gateways Interface (CGI), Active Server Page (ASP), Overview Of Java Servlet, Java Servlet Architecture, Overview Of Servlet API, Building The Virtual Bookstore- Step By Step, Your First Servlet- Welcome To VBS, Compilation And Execution Of Servlets, An Interactive Servlet Program Example: Topics Of Interest, Topics Of Interest: Cookie Approach.

Server-Side Programming II: Database Connectivity- Introduction, Relational Database Systems, JDBC Perspectives, A JDBC Program Example: Simple Servlet Book Query, An Advance Book Query: Servletbookquerymulti, Advanced JDBC Servlet: VBS Advance Book Search Engine. **Server-Side Programming III: Session Tracking-** Introduction, Traditional Session Tracking Techniques, The Servlet Session Tracking Techniques, The Servlet Session Tracking API, A Practical Case: VBS Shopping Cart. **Basic Cryptography Enabling E-Commerce-** Security Concern, Security Requirements, Encryption, Two Basic Principles For Private Key Encryption, The Key Distribution Problem, Diffie-Hellman Key Exchange Protocol, Public Key Encryption, RSA Encryption Algorithm, Hybrid Encryption, Other Public Key Encryption Methods, Stream Cipher And Block Cipher, Message Digest, Message Authentication Code, Digital Signature, Digital Signature Standard, Authentication.

UNIT - III

Internet Security- IPSec protocol, setting up associations, the authentication header (AH) service, the encapsulating security payload (ESP) service, preventing replay attack, application of IPSec: virtual private network, firewalls, different types of firewalls, example of firewall system, secure socket layer (SSL), putting everything together. **Advanced techniques for e-commerce-** introduction to mobile agents, WAP: the enabling technology for mobile commerce, XML (eXtensible Markup Language), Data mining.

UNIT - IV

Internet Payment System- Characteristics Of Payment System, 4C Payment Methods, SET Protocol For Credit Card Payment, E-Cash, E-Check, Micropayment System, Overview Of Smart Card, Overview Of Mondex, Putting It All Together For Payment In The VBS. Consumer **Oriented E-Commerce**- Introduction, Traditional Retailing And E-Retailing, Benefits Of E-Retailing, Key Success Factors, Models Of E-Retailing, Features Of Retailing, Developing A Consumer-Oriented E-Commerce System, The PASS Model. **Business Oriented Commerce- Features**Of B2B E-Commerce, Business Model, Integration. **E-Services-** Categories Of E-Services, Web-Enabled Services, Matchmaking Services, Information-Selling On The Web, E-Entertainment, Auctions And Other Specialized Services, Traditional Versus Internet Advertising, Internet Advertising Techniques And Strategies, Business Models For Advertising And Their Revenue Streams, Pricing Models And Measurement Of The Effectiveness Of Advertisements, Web Publishing- Goals And Criteria, Web Site Development Methodologies, Logical Design Of The User Interface I- Abstract User Interface, Logical Design Of The User Interface II- Flow Of Interaction, Usability Testing And Quality Assurance, Web Presence And Visibility.

Text Book:

1. Henry Chan, Raymond Lee, Tharam Dillon, & Elizabeth Chang, E-Commerce – Fundamentals and Applications, Wiley.

Reference Books:

1. Eric van der Vlist, Danny Ayers, Erik Bruchez, Joe Fawcett, AlessandroVernet, Professional Web 2.0 Programming, Wiely.
2. Michael P. Papazoglou, Pieter M.A. Ribbers, e-Business, Wiely.
3. Brian P. Hogan, HTML5 and CSS3, Shroff Publishers.
4. Sandeep panda, AngularJS – Novice to Ninja, Shroff Publishers.

Practical List ofE-Commerce & Web Designing

1. Write a program in HTML to illustrate the use of Formatting tags => BOLD, ITALIC, UNDERLINE, SUPERSCRIPT, SUBSCRIPT, AND STRIKETHROUGH.

2. Write a paragraph centrally aligned and change the color of text to BLUE and Background to YELLOW. The size of the font should be 6.

3. Write a program in HTML to illustrate the below given formats.
   a) The page should contain a paragraph which is centrally aligned.
   b) FIRST line of the paragraph should be BOLD and ITALIC.
   c) STRIKEOUT the Second Line.
   d) Underline and change the color to RED, of the third line.
   e) Change the font size of the fourth Line to 5.
   f) Change the color of the text to GREEN.
   g) Two horizontal lines below the paragraph.

4. Write a program in HTML to link two files.
   a) The name of the first file is LINK1.HTML and that of second file is LINK2.HTML.
   b) LINK2.HTML should contain a Back link also.

5. Write a program in HTML to Design a Table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY.

6. Write a program in HTML to design a Table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY. The table should also contain the below given specifications.
    a) Table should contain BORDER.
    b) Background color of the Table should be GREEN.
    c) Color of the Text should be BLUE.
    d) Text should be centrally aligned in the cell.

7. Write a program in HTML to Design a Table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY. Illustrate the usage of cell padding and cell spacing. Also align the Table to the CENTRE of the page.

8. Write a program in HTML to illustrate the usage of ROWSPAN in the below given format.

CITY	TOWN
NAGPUR	SHANKAR NAGAR
	DHARAMPETH
	RAMDASPETH
BOMBAY	DADAR
	V.T.
	THANE

9. Write a program in HTML to illustrate the usage of COLUMN SPAN (COLSPAN) in the below given format.

NAME	LIVING CITY	COMPANY CITY
SUJEET	CHHINDWARA	
TAPAN	NAGPUR	BOMBAY
RAM	BOMBAY	
MOHAN	BANGALORE	
KRISHNA	PUNE	
MANGESH	BOMBAY	NAGPUR
AVINASH	DELHI	

10. Write a program in HTML to divide the screen horizontally into two sections.

11. Write a program in HTML to divide the screen vertically into two sections.

12. Write a program in HTML to divide the Screen into 4 sections.

13. Write a program in HTML to demonstrate the usage of Marquee text with the below given Specifications.
    Marquee text is INTERNATIONAL COLLEGE.
    Color of text is BLUE.
    Background color is YELLOW.
    Size of Text is 7.
    Direction is LEFT to RIGHT.

14. Write a program in HTML to demonstrate the use of the Marquee Text with the below given Specifications.
    a) Marquee Text is INTERNATIONAL COLLEGE.
    b) Text color is BLUE.
    c) Repeat the Marquee Text five Times.
    d) Make use of SCROLLAMOUNT.

e) Make use of SCROLLDELAY.

15. Write a program in HTML to demonstrate the usage of Image file with the below
    a) given specification.
    b) Background color of page is GREEN.
    c) The size of Image is 400 x 400 pixels.
    d) The Image should contain a border.
    e) Alternate text is “IMAGE NOT FOUND”.
    f) Image should appear on the centre of the page.

16. Write a program in HTML to Demonstrate the usage of Image file with the below given specifications.
    a) Background color is RED.
    b) The size of Image is 300 x 300 pixels.
    c) The image should contain a BORDER.
    d) Alternate Text is “IMAGE is NOT FOUND”.
    e) Vertical space should be 100 pixels.
    f) Horizontal space should be 350 pixels.

17. Write a program in Java Script which should prompt the user to enter the result of Question-“What is the result of 10+10?”. The user will be given a chance to answer the question. If the answer is correct then the program should raise a message-“Congratulations”. If the answer is wrong then the program should again ask the same question. If the answer is correct then the message should be –“Cleared in the second round” else another message should be generated specifying –“Sorry, try next time” and the program should exit. Note – Make use of If. Else.

18. Write a program in Java Script which should prompt the user to enter the result of question –“What is the Result of 10 +10? At the most the user will get 5 chances to answer the question. If the user gives the correct answer during the attempts then the program should exit the loop by raising a message-“Congratulations “. Otherwise, whenever the answer is wrong the program should alert the user that the answer is wrong. Even during the 5^{th} attempt, if the answer is wrong then it should raise another alert message also specifying- “Sorry- Try Next Time”. (Use Loop, Prompt and Alert).

19. Write a program in Java Script which prompt the user to enter the Result of Question- “What is the Result of 10+10?.
    The program should repeat the question in two cases-
    a. If the user is wrong.
    b. And he wants to continue.
    The program should exit the loop in two cases-
    b) If the answer is correct.
    c) If the answer is wrong but the user doesn’t want to continue.
    d) (Use odd Looping, Prompt, Alert and Confirm Dialog Boxes).
20. Write a program in Java Script which raises a Message:”
    “Welcome To Our Website” as soon as the Site is loaded. It should also display a message: -“Thank You “ when the user switch over from the page.

21. Write a program in Java Script to check the username. If the user name is correct, the program should give an alert message-: “Welcome” along with user name else the program should alert the user specifying that the user name is wrong. Use DOM and onchange event.

22. Write a suitable program in Java Script which displays a message depending on the radio button being clicked using DOM and onclick event.

23. Write a program in Java Script to count the number of elements in a forms elements array. Check the number of elements returned against the number of form elements described between < Form> and </Form> tag in HTML page that is running in the browser. Recognize that number of elements in the array match the number of elements described between <FORM> and </FORM> tag in HTML page exactly.

24. Write a program in Java Script to check whether the form is filled or not. If one of the elements is not filled then display an alert message to fill the particular element using DOM and BUTTON.

25. Write a program in Java Script to check whether the form is completely filled or not. If one of the elements is not filled then display an alert message to fill the particular element using DOM and onsubmit event.

MCM Part-II

Semester - III

Paper - I: Advance Database Management Systems (3T1)

UNIT – I

Introduction to Database Management System(DBMS) – Introduction, Why a Database, Characteristic of Data in a Database, Database Management System, Why DBMS, Types of Database Management System, Object-Oriented Model, Object-Relational Model, Deductive/Inference Model, Compression Between the various Database Model. **Introduction to Relational Database Management System(RDBMS)-** Introduction , RDBMS Terminologies, The Relational Data Structure, Relational Data Integrity, Relational Data Manipulations, Codd's Rule. **Database Architecture and Data Modeling** – Introduction, Conceptual, Physical and Logical Database Model, External or Logical Level. **Entity-Relationship Modeling**- Introduction, E-R Model, Components of an E-R Model, E-R Modeling Symbols. **Data Normalization-** Introduction, First Normal Form(1NF), Second Normal Form(2NF), Third Normal Form(3NF), Boyce-Codd Normal Form(BCNF), Fourth Normal Form(4NF), Fifth Normal Form(1NF), Domain-Key Normal Form(DKNF), Renormalizations. **Relational Algebra and Relational Calculus**- Relational Algebra, Relational Calculus.

UNIT – II

Introduction to Structured Query Language(SQL) – Introduction, History of SQL, Characteristic SQL, Advantages of SQL, SQL in Action, SQL Data Types and Literals, Types of SQL Commands, SQL Operators, Arithmetic Operators, Compression Operators, Logical Operators, Set Operators, Operators Precedence. **Tables, View and Index** – Tables, View , Index. **Nulls** – Introduction, Nulls in Action, When not to Use Nulls, Effect of Nulls, Null Indicators, Null and Compression Operator, Testing of Nulls, Tests of true, False and Unknown, BETWEEN, LIKE and IN Condition, ALL and ANY Condition, EXITS Condition, ORDERED BY Clause. **Query And Subqueries** - Query ,Subqueries. **Aggregate Function** – Introduction, General Rule, COUNT() and COUNT(*), SUM(), AVG(), MAX() and MIN(). **Insert, Update and Delete Operation** – Introduction, Insert Statement, Bulk Insert of Data, Update Statement, Delete Statement**Cursors** – Introduction, Cursor Operation, Cursor Positions, Cursor Coding Guideline. **Join And Union** - Join, Union.

UNIT – III

Programming with SQL- Introduction, Query Processing, Embedded SQL, Dynamic SQL. **Query-By-Example(QBL)** – Introduction, Select Query in QBE, Make-Table Query, DELETE Query, UPDATE Query, APPEND Query, QBE and SQL. **QUEL**- Introduction, Data Definition in QUEL, Data Retrieval in QUEL, Data UPDATE Operation in QUEL. **Triggers** – Introduction, What is Trigger?, Types of Triggers, Triggers Syntax, Combining Triggers Types, Setting Inserted Value, Disabling and Enabling Triggers, Replacing Triggers, Dropping Triggers, Advantages and Limitations of Triggers. **Introduction-** PL/SQL Blocks, PL/SQL Architecture, SQL Support, PL/SQL Variables, PL/SQL Data Types, PL/SQL Precompilers, Conditional And Sequential Control Statements, Control Statements, Cursors, Iterative Control Statements, PL/SQL Exceptions, PL/SQL Blocks, PL/SQL Triggers, Types Of Triggers, Procedures And Packages.

UNIT – IV

Data Ware House and Data Marts – Introduction, Data in the Data Ware House, Data Ware House, Design Issues, OLTP vs. Data Ware House, Configuration of Data Ware House Process, Data Ware House Components, Structure of Data Ware House, Data Ware House Life Cycle, Data Ware House Environment, Data Architecture Data Ware House Operation, How much Data?, Data Integration and Transformation Process. **Data Mining** - Introduction, What is Data Mining?, Evaluation of Data Mining, Data Mining Verification vs. Discovery, Tasks Solve by Data Mining, Advantages of Data Mining. On-Line Transaction Processing(OLTP) - Introduction, Designing Criteria OLTP Features, Practical Application of OLTP, Future trends in OLTP. **On-Line Analytical Processing(OLAP)** – Introduction, OPAP and OPAP, OLAP and Data Ware Housing, Use of OLAP, Benefits of OLAP, Evaluation of OLAP, OLAP Concept and Characteristic, Cood's OPLAP Product Evaluation Rules, Different Style of OLAP.

Text Book:

1. Alexis Leon, Mathews Leon, Database Management System, LeaonVikas.

Reference Books:

1. RiniChakrabarti, ShilbhadraDasgupta&Subhash K. Shinde, Advance Database Management System, Dreamtech Press.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, McGraw-Hill.
3. G. K. Gupta, Database System Concepts, McGraw-Hill.
4. Dr. P. S. Deshpande, SQL & PL/SQL for Oracle 11g, Dreamtech Press.
5. Ivan Bayross, SQL, PL/SQL, BPB Publications.

Practical List ofSQL & PL/SQL

1. Write a SQL Query to create a table**"employee"**:

Field Name	Datatype	Size
Emp_no	varchar2	5
Emp_name	varchar2	25
Address	varchar2	50
Phone_number	number	10
Designation	varchar2	15
Salary	number	15

1. Display the structure of table.
2. Add qualification field at the end of employee table.
3. Modify the size of the name field 25 to 30.
4. Display the employee name whose salary is greater than 20,000.
5. Display the employee details whose name starts with "A".

2. Write a SQL Query to create a table **"student"**:

Field Name	Datatype	Size	Constraint
Roll	number	5	primary key
Name	varchar2	30	first letter must start with 'A'
Address	varchar2	30	not null
City	varchar2	30	
DOB	date		
Phone	number	11	unique key
Class	varchar2	10	All upper letter
Marks	number	(10, 2)	Not null can't be 0

1. Display the structure of database and insert 10 records.
2. Display student information for all student in city Pune and Nagpur.
3. Display student information where marks greater than 80 and less than 90.

4. Display student name where first two character of student name ‘An’.
5. Change student name to Ashish where student roll number A001.

3. Write a SQL Query to create a table **“sales_details”**:

Field Name	Datatype	Size
S_id	varchar2	8
P_id	varchar2	8
P_name	varchar2	15
Price	number	10
Qty	number	8

1. Drop foreign key constraint on column p_no in table sales_details.
2. Add foreign key constraint on column sale_no in table sales_details.
3. Modify the column qty to include not null constraint.
4. Insert 10 records in sale_details.
5. Display p_id and total of quantity qty for each product.
6. Display p_id and total of price for all the products.

4. Write a SQL Query to create a table **“customer”**:

FieldName	Datatype	Size
Cust_no	varchar2	10
Cust_name	usertype	
Address	varchar2	10
Salary	number	10

1. Modify address field with not null.
2. Add city field as it must keep city name Mumbai, Delhi and Kolkata.
3. Add salary field where salary greater than 20,000.
4. Display the structure of table customer.
5. Insert 10 records into the table customer.
6. Display all the customer details who lives in Mumbai and Kolkata.
7. Display all the customer records whose salary>20,000 and salary<30,000.
8. Modify the address field where customer number is ‘C001’.

5. Write a SQL query to create **c_master** with fieldsc_no, name, address, city, state and pin_code:

Field Name	Datatype	Size
C_no	varchar2	10
Name	varchar2	10
Address	varchar2	10
State	varchar2	20
City	varchar2	20
Pin_code	number	10

1. Create sequence which will generate number from 1..999 in ascending order, with an interval of 1 and in cyclic order.
2. Insert 10 records.
3. Create index on c_master which column name c_no and state.
4. Create view on c_master .
5. Select columns c_no, city which belongs to Nagpur and Mumbai.

6. Write a SQL query to create a syntax seq_order which generating numbers from 1…9999 in ascending will number with an interval of 1 in cyclic order.

Field Name	Datatype	Size
P_no	varchar2	10
P_name	varchar2	20
Qty	varchar2	10
P_rate	varchar2	10

1. Display next value of sequence seq_order.
2. Display current value of sequence seq_order.
3. Insert values in sal_order table must be generated using sal_order sequence.
4. Display all records of sal_order table.
5. Change a cache memory of 50 seq_order sequence having interval 2.
6. Drop sequence.

7. Write a SQL Query to-

1. Create an index employee_index depends on employee table using field name.
2. Create a view depends on employee table.
3. Display the records from the view where city as Delhi and Mumbai.
4. Update the view where employee id is 'E006'.

8. Write a SQL query to illustrate numeric function.

1. Sqrt 2. Ceil 3. Power 4. Floor 5. Round
6. Mod 7. Abs 8.Exp 9.Greatest 10. Least

9. Write a SQL query to create tablespace datauser or data where size of file 100MB extend it by 10MB reach upto 250MB in size. Create user data1 with default tablespace and temporary tablespace. Create role acc_create with create session, create user, alter user and assign role to user. Assign profile to user where user should fail after 5 attempt and valid for 3 days. Destroy user data1 and tablespace from system.

10. Write a SQL query for join, inner join, outer join, self join and Cartesian join.

11. Write an algorithm, draw a flowchart and develop a PL/SQL program to check given number is odd or even.

12. Write an algorithm, draw a flowchart and develop a PL/SQL program to check number is reverse or not.

13. Write an algorithm, draw a flowchart and develop a PL/SQL program to check number is palindrome or not.

14. Write an algorithm, draw a flowchart and develop a PL/SQL program to find the number is Armstrong or not.

15. Write an algorithm, draw a flowchart and develop a PL/SQL program to find the addition of all the number in the given range.

16. Write an algorithm, draw a flowchart and develop a PL/SQL program to find the number is prime or not.

17. Write an algorithm, draw a flowchart and develop a PL/SQL program to calculate factorial of a given number.

18. Write an algorithm, draw a flowchart and develop a PL/SQL program to generate Fibonacci series.

19. Write an algorithm, draw a flowchart and develop a PL/SQL program to insert a new element in a given position in the array.

20. Write an algorithm, draw a flowchart and develop a PL/SQL program to delete the duplicate element from the array.

21. Write an algorithm, draw a flowchart and develop a PL/SQL program to sort the data in ascending order.

22. Write an algorithm, draw a flowchart and develop a PL/SQL program to find reverse of a string.

23. Write an algorithm, draw a flowchart and develop a PL/SQL program to find palindrome of a string.

24. Write an algorithm, draw a flowchart and develop a PL/SQL program to calculate number of char, spaces, words from given string.

25. Write an algorithm, draw a flowchart and develop a PL/SQL program to find largest and smallest element of given array using function concept.

26. Write an algorithm, draw a flowchart and develop a PL/SQL program to print ASCII table.

27. Write an algorithm, draw a flowchart and develop a PL/SQL program to change sale_price of product_master table where pro_no is 'C001' and insert records with date on which price was changed last in new_master table whose fields are prod_no, date, sale_price.

28. Write an algorithm, draw a flowchart and develop a PL/SQL program to accept the employee whose job is programmer and update the salary of the employee. Display how many rows are affected.

29. Write an algorithm, draw a flowchart and develop a PL/SQL program to display the name, dept, name and salary of first 10 employees getting the highest salary using explicit cursor.

30. Write an algorithm, draw a flowchart and develop a PL/SQL program to check whether emp_no of employees exists or not using procedure.

Paper - II: Principles & Techniques of Management (3T2)

UNIT – I

Concepts And Nature of Management, Evolution of Management Thought, Management Process, Social Responsibilities of A Business, Coordination,

UNIT – II

Nature and Process Of Planning, Methods And Types Of Plans, Forecasting And Decision Making, Management Information System, Organizing Functions.

UNIT – III

Departmentation And Organization Structure, Nature And Scope Of Staffing, Training And Development, Performance Appraisal And Problem.

UNIT – IV

Direction and Supervision, SUPERVISION, Motivation and Moral, MOTIVATION, MORAL, Leadership, Communication, Techniques of managerial control.

Text Book:

1. R.S.N. Pillai& S. Kala, Principles & Practice of Management, S. Chand.

Reference Books:

1. Chandra Bose, Principles of Management & Administration, PHI.
2. P C Tripathy& P N Reddy, Principles of Management, McGraw-Hill.
3. V.P. Michel, Principles of Management.
4. Mohan, Developing of Communication Skills.
5. Philip Kotlar, Marketing Management.
6. C. B. Memoria, Personnel Management.
7. AshaKaul, Business Communication, PHI.

Paper - III: Elective
Elective – I: PHP & My-SQL (3T3)

UNIT - I

Introducing PHP- Why PHP and MySQL?**,**What Is PHP?, What Is MySQL?.**Server-Side Scripting Overview**- Static HTML,Client-Side Technologies, What Is Server-Side Scripting Good For?**Learning PHP Syntax and Variables-** PHP Is Forgiving, HTML Is Not PHP, PHP's Syntax Is C-Like, Comments, Variables, Types in PHP: Don't Worry, Be Happy, Type Summary, The Simple Types, Output. **Learning PHP Control Structures and Functions-** Boolean Expressions, Branching, Looping, Alternate Control Syntaxes, Terminating Execution, Using Functions, Function Documentation, Defining Your Own Functions, Functions and Variable Scope, Function Scope.**Passing Information with PHP-**HTTP Is Stateless, GET Arguments, A Better Use for GET-Style URLs, POST Arguments, Formatting Form Variables, PHP Superglobal Arrays.**Learning PHP String Handling-** Strings in PHP, String Functions.**Learning Arrays-** The Uses of Arrays, What Are PHP Arrays?, Creating Arrays, Retrieving Values, Multidimensional Arrays, Inspecting Arrays, Deleting from Arrays, Iteration. **Learning PHP Number Handling-** Numerical Types, Mathematical Operators, Simple Mathematical Functions, Randomness.**PHP Gotchas-** Installation-Related Problems, Rendering Problems, Failures to Load Page, Parse Errors, Missing Includes, Unbound Variables, Function Problems, Math Problems.

UNIT - II

Introducing Databases and MySQL- What Is a Database?, Why a Database?, PHP-Supported Databases.**Installing MySQL**- Obtaining MySQL, Installing MySQL on Linux, Installing MySQL on Microsoft Windows.**Learning Structured Query Language (SQL)-** Relational Databases and SQL,SQL Standards, The Workhorses of SQL, Database Design, Privileges and Security.**Learning Database Administration and Design-** Basic MySQL Client Commands, MySQL User Administration, Backups, Replication, Recovery.**Integrating PHP and MySQL-** Connecting to MySQL, Making MySQL Queries, Fetching Data Sets, Getting Data about Data, Multiple Connections, Building in Error Checking, Creating MySQL Databases with PHP, MySQL Functions.**Performing Database Queries-** HTML Tables and Database Tables, Complex Mappings, Creating the Sample Tables.**Integrating Web Forms and Databases-** HTML Forms, Basic Form Submission to a Database, Self-Submission,Editing Data with an HTML Form.**Improving Database Efficiency-** Connections — Reduce, Reuse, Recycle, Indexing and Table Design, Making the Database Work for You. **MySQL Gotchas-** No Connection,

Problems with Privileges, Unescaped Quotes, Broken SQL Statements, Too Little Data, Too Much Data, Specific SQL Functions, Debugging and Sanity Checking.

UNIT - III

Introducing Object-Oriented PHP- What Is Object-Oriented Programming?, Basic PHP Constructs for OOP, Advanced OOP Features, Introspection Functions, Extended Example: HTML Forms, Gotchas and Troubleshooting, OOP Style in PHP. **Advanced Array Functions-** Transformations of Arrays, Stacks and Queues, Translating between Variables and Arrays, Sorting, Printing Functions for Visualizing Arrays.**Examining Regular Expressions-** Tokenizing and Parsing Functions, Why Regular Expressions?, Perl-Compatible Regular Expressions, Example: A simple link-scraper, Advanced String Functions. **Working with the File system-** Understanding PHP File Permissions, File Reading and Writing Functions, File system and Directory Functions, Network Functions, Date and Time Functions, Calendar Conversion Functions.**Working with Cookies and Sessions-** What's a Session?, Home-grown Alternatives, How Sessions Work in PHP, Sample Session Code, Session Functions, Configuration Issues, Cookies, Sending HTTP Headers, Gotchas and Troubleshooting. **Handing Exceptions with PHP-** Error Handling in PHP, Other Methods of Error Handling, Logging and Debugging.**Debugging PHP Programs-** General Troubleshooting Strategies, A Menagerie of Bugs, Using Web Server Logs, PHP Error Reporting and Logging, Error-Reporting Functions. **Learning PHP Style-** The Uses of Style, Readability, Maintainability, Robustness, Efficiency and Conciseness, HTML Mode or PHP Mode?, Separating Code from Design.

UNIT - IV

Sending E-Mail with PHP- Sending E-Mail with PHP, Sending Mail from a Form, **Integrating PHP and Java-** PHP for Java programmers, Integrating PHP and Java.**Integrating PHP and JavaScript**- Outputting JavaScript with PHP, PHP as a Backup for JavaScript, Static versus Dynamic JavaScript.**Integrating PHP and XML-** What Is XML?, Working with XML, Documents and DTDs, SAX versus DOM, DOM, SAX, SimpleXML API, A Sample XML Application, Gotchas and Troubleshooting. **Creating and Consuming Web Services with PHP**- The End of Programming as We Know It, REST, XML-RPC, SOAP, .NET, Current Issues with Web Services, Project: A REST Client. **Creating Graphics with PHP-** Your Options,HTML Graphic**s,** Creating images using gd, Gotchas and Troubleshooting.

Text Book:

1. Steve Suehring, Tim Converse & Joyce Park, PHP and MySQL, Wiely.

Reference Books:

1. Joel Murach& Ray Harris, murach's PHP and MySQL, Shroff Publishers.
2. Timothy Boronczyk, Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass, Beginning PHP6, Apache, MySQL Web Development, Wiley.
3. Jason Gilmore, Beginning PHP and MySQL.
4. Teach Yourself MySQL in 21 days – Techmedia.

Practical List of PHP & My-SQL

1. Write an algorithm, draw a flowchart and Write a PHP script to get the PHP version and configuration information.

2. Write an algorithm, draw a flowchart and Write a PHP script to print the Fibonacci series up to the entered range.

3. Write an algorithm, draw a flowchart and Write a PHP script to change the color of first character of a word.

4. Write an algorithm, draw a flowchart and Write a PHP script to test whether a number is greater than 30, 20 or 10 using ternary operator.

5. Write an algorithm, draw a flowchart and Write a PHP script to calculate the factorial of a number (non-negative integer) using functions.

6. Write an algorithm, draw a flowchart and Write a PHP script to insert a new item in an array on any position.

7. Write an algorithm, draw a flowchart and Write a PHP script to sort an array of positive integers using the Sort function asort() and ksort().

8. Write an algorithm, draw a flowchart and Write a PHP script to
    a) Transform a string all uppercase letters.
    b) Transform a string all lowercase letters.
    c) Make a string's first character uppercase.
    d) Make a string's first character of all the words uppercase.
9. Write an algorithm, draw a flowchart and Write a PHP script to display all the numbers between 200 and 250 that are divisible by 4.

10. Write an algorithm, draw a flowchart and Write a PHP class which displays an introductory message like "Hello All, Good Morning ", where "Morning" is an argument value of the method within the class.

11. Write an algorithm, draw a flowchart and Write a PHP Calculator class which will accept two values as arguments, then add them, subtract them, multiply them together, or divide them on request.

12. Write an algorithm, draw a flowchart and Write a PHP script to convert a date from yyyy-mm - dd to dd – mm-yyyy.

13. Write an algorithm, draw a flowchart and Write a PHP script to remove the whitespaces from a string.

14. Write an algorithm, draw a flowchart and Write a PHP function that checks if a string is all lower case.

15. Write an algorithm, draw a flowchart and Write a PHP script tocheck whether a entered string is palindrome or not.

16. Write an algorithm, draw a flowchart and Write a PHP script to print Fibonacci series using recursion.

17. Write an algorithm, draw a flowchart and Write a PHP script using switch case and dropdown list display a - Hello|| message depending on the language selected in drop down list.

18. Write an algorithm, draw a flowchart and Write a PHP script to replace the first 'the' of the following string with 'That' –
    Sample: 'the quick brown fox jumps over the lazy dog.'
    Expected Result: That quick brown fox jumps over the lazy dog.

19. Write an algorithm, draw a flowchart and Write a PHP script tocheck that emailid is valid or not.

20. Write an algorithm, draw a flowchart and Write a PHP script to create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.

21. Write a SQL statement to create simple table countries including columns country_id, country_name and region_id.

22. Write a SQL statement to create table countries including columns country_id, country_name and region_id and make sure that the column country_id will be unique and store an auto incremented value.

23. Write a SQL statement to create a table named countries including columns country_id, country_name and region_id and make sure that no countries except Italy, India and China will be entered in the table.

24. Write a SQL statement to insert a record with your own value into the table countries against each columns region_id.

25. Write a SQL statement to rename the table countries to country_new.

26. Write an algorithm, draw a flowchart and Write a PHP script to which will receive the data captured by the HTML form, display the name of the form and also display the message Data Entered Successfully on the HTML form page after performing the validations.

27. Write an algorithm, draw a flowchart and Write a PHP script to creating, retrieving and deleting data from the cookie using POST Method.

28. Write an algorithm, draw a flowchart and Write a PHP scriptto create, retrieve and deleting the session data.

29. Write an algorithm, draw a flowchart and Write a PHP script to navigate the HTML Page with the use of JavaScript and PHP.

30. Write an algorithm, draw a flowchart and Write a PHP script to create login form with the fields' username and password with validation.

31. Write an algorithm, draw a flowchart and Write a PHP script to send e-mail from a form.

32. Write an algorithm, draw a flowchart and Write a PHP script to demonstrate the use of REST.

33. Write an algorithm, draw a flowchart and Write a PHP script to demonstrate the use of SOAP.

34. Create a table in MySQL named Programmer having the fields' id, sex, age, Language, OS, and Country with constraint, insert up to 20 values and write a PHP Script to generate a Bar Graph according to specific column the user selected.

35. Write an algorithm, draw a flowchart and Write a PHP script to create a registration form having two buttons Submit and Reset with validations. The form data should be submitted in MySQL databasewith coding to integrate the MySQL with PHP.

Paper - III: Elective
Elective – II: VB. Net (3T3)

UNIT - I

Visual Basic .NET and the .NET Framework: The Common Language Runtime, Understanding Assemblies, The .NET Security Model. **The Visual Basic .NET Development Environment:** Working with the Visual Studio IDE, Creating a Visual Basic .NET Solution. **The Elements of Visual Basic .NET:** Visual Baisc .NET: The Foundation, Getting Started, Classes, Types, and Objects. **Visual Basic .NET Operators. Software Design, Conditional Structures, and Control Flow:** Control Flow,Conditional Statements,Loops, Pausing, Resuming, and Exiting Iteration.

UNIT - II

Methods: What is Method, Method Data, Method Access Characteristics, Properties, Introduction to Exception Handling, Design and Construction of Method. **Classes:** Class characteristics, Inheritance. **Exception Handling and Classes:** Structured Exception Handling, Exception Statements, Creating your own Exception Class. **Collections, Arrays, and Other Data Structures:** Stacks, Queues, Arrays, Jagged Arrays, Programming against Arrays, Array Exceptions.

UNIT – III

Advanced Interface Patterns:Adapter, Delegates, and Events: Adapters and Wrappers, Delegates, sorting Data with Delegates, Multicast Delegates. **Data Processing and I/O :** Data Processing, Working with Strings, Members of the String Class, Classic Visual Basic String Functions, String Formatting, Building Strings with String builder. Files and Directories, Streams.

UNIT – IV

Interfacing with the End User: Windows Form, Introduction to Threading, MDI Application, Components and Controls, Menus and Toolbars, Response to User Input, Collecting User Input, Presentation and Informational Controls, Drag and Drop. **Getting Ready to Release:** The System. Diagnostics Namespace, Enabling Debugging, Run-time Configuration Files, Working with the Debug Class, Tracing and Trace Class, Debugging with Visual Studio .NET, The Visual Studio .NET Compiler.

Text Book:

1. Jeffry R. Shapiro, The Complete Reference, Visual Basic .NET McGraw- Hill.

Reference Books:

1. Thearon Willis, Jonathan Crossland, Richard Blair, Beginning CB.Net 2003, Dreamtech Press, Wiley.
2. Francesco Balena, Programming Microsoft Visual Basic.net, Microsoft Press.
3. Jeffrey Kent, Visual basic.Net – A Beginner's Guide, McGraw- Hill.

Practical List ofVB. Net

1. Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the sum of all digits of a number.

2. Write an algorithm, draw a flowchart and develop a VB.NET console application to implement the sine series.

3. Write an algorithm, draw a flowchart and develop a VB.NET console application to remove all duplicate elements from an array.

4. Write an algorithm, draw a flowchart and develop a VB.NET console application to create all possible sets from given set {1, 2, 3 }.

5. Write an algorithm, draw a flowchart and develop a VB.NET console application to display the following pattern –

```
      *
    * * *
  * * * * *
* * * * * * *
  * * * * *
    * * *
      *
```

6. Write an algorithm, draw a flowchart and develop a VB.NET console application to check a number is Armstrong or not.

7. Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the decimal number from binary number.

8. Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the first 50 prime and unprimed numbers.

9. Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the reverse of a string and check the string is palindrome or not.

10. Write an algorithm, draw a flowchart and develop a VB.NET console application to Search an element from characters and as well as from numbers using binary search method.

11. Write an algorithm, draw a flowchart and develop a VB.NET console application to sort a given string in the order of alphabets, digits & symbol.

12. Write an algorithm, draw a flowchart and develop a VB.NET console application to input array element, sorting them and remove duplicate element.

13. Write an algorithm, draw a flowchart and develop a VB.NET console application to create jagged array and arrange data in ascending order.

14. Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate day of the week from a date without using any in build function.

15. Write an algorithm, draw a flowchart and develop a VB.NET console application to demonstrate exception handling.

16. Write an algorithm, draw a flowchart and develop a VB.NET windows application to check the user id and password is valid or not.

17. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create a scientific calculator.

18. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create text editor.

19. Write an algorithm, draw a flowchart and develop a VB.NET windows application to generate stopwatch.

20. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create a start menu using status bar.

21. Write an algorithm, draw a flowchart and develop a VB.NET windows application to load the images & run Executable files using the file control.

22. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create trial version DLL.

23. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create a menu and perform any operation.

24. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create MDI and arrange all forms as tiles and cascade form.

25. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create popup menu.

26. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create your own delegates.

27. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create data bound control for retrieving the data from database.

28. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create crystal report.

29. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create different dialog box and perform any operation.

30. Write an algorithm, draw a flowchart and develop a VB.NET windows application to enter an e-mail ID into a textbox and check the e-mail ID is valid or not.

Paper - III: Elective
Elective – III: C#. Net(3T3)

UNIT - I

Introducing C# - What is C#?**,**Evaluation of C#**,** Characteristics of C#**,** Application of C#**,** How does C# Differ from C++?**,** How does C# Differ from Java?. **Understanding .NET: The C# Environment –** The .NET Strategy, The Origin of .NET Technology, The .NET Framework, The Common Langue Runtime, Framework Base Class, User and Program Interface, Visual Studio .NET, .NET Languages, Benefits of the .NET Approach, C# and .NET. **Overview of C#** - Introduction, A Simple C# Program, Namespaces, Adding Comments, Main Running Value, Using Aliases for Namespaces Classes, Passing String Objects to WriteLine Method, Command Line Argument, Main with Class, Providing Interactive Input, Using Mathematical Function, Multiple Main Methods, Compile Time Error, Program Structure, Program Coding Style. **Literals, Variables and Data Types** – Introduction, Literals, Variables, Data Types, Value Types, Reference Type, Declaration Types, Initialization of Variables, Default Value, Constant Variable, Scope of Variables, Boxing and Unboxing. **Operators and Expressions** – Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversion, Operator Precedence and Associativity, Mathematical Function. **Decision Making and Branching** – Introduction, Decision Making with if Statement, Simple if Statement, The if…else Statement, The else if Ladder, The Switch Statement, The ? : Operator, Decision Making and Looping – Introduction, The while Statement, The do Statement, The for Statement, The foreach Statement, Jumps in Loops

UNIT - II

Methods in C# - Introduction, Declaring Methods, The Main Method, Invoking Methods, Nesting of Methods, Method Parameters, Pass by Value, Pass by Reference, The Output Parameters, Variables Argument List, Methods Overloading. **Handling Arrays** – Introduction, One-Dimensional Array, Creating an Array, Two-Dimensional Array, Variable-Size Arrays, TheSystem.Array Class, ArrayList Class. Manipulating Strings – Introduction, Creating String, String Methods, Inserting String, Comparing String, Finding String, Mutable String Arrays of String, Regular Expressions.**Structures and Enumerations** – Introduction, Structurs, Structs with Methods, Nested Structs, Difference between Classes and Structs, Enumerations, Enumerator Base Type, Enumerator type Conversion.

UNIT - III

Classes and Objects - Introduction, Basic Principle of OOP, Defining a Class, Adding Variables, Adding Methods, Member Access Modifiers, Creating Objects, Accessing Class Members, Constructors, Overloaded Constructors, Static Members, Static Constructors, Private Constructors, Copy Constructors, Destructors, Member Initialization, The This Reference, Nesting of Members, Constant Members, Read-only Members, Properties, Indexers. **Inheritance and Polymorphism** – Introduction, Classical Inheritance, Containment Inheritance, Defining a Subclass, Visibility Control, Defining Subclass Constructors, Multilevel Inheritance, Hierarchical Inheritance, Overriding Methods, Hiding Methods, Abstract method, Sealed Class: Preventing Inheritance, Sealed Methods, Polymorphism. **Interface: Multiple Inheritance** – Introduction, Defining an Interface, Extending Interface, Implementing Interface, Interface

and Inheritance, Explicit Interface Implementation, Abstract Class and Interface. **Operator Overloading** – Introduction, Overloadable Operators, Need for Operator Overloading, Defining Operator Overloading, Overloading Unary Operator, Overloading Binary Operator, Overloading Comparison Operator.

UNIT - IV

Delegates and Events – Introduction, Delegates, Delegates Declaration, Delegates Methods, Delegates Instantiation, Using Delegates, Multicast Delegates, Events.**Managing Errors and Exceptions –** Introduction, What is Debugging?, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, The Exception Hierarchy, General Catch Handler, Using Finally Statement, Nested Try Blocks, Throwing Our Own Exceptions, Checked and Unchecked Operators, Using Exceptions for Debugging. **Multithreading in C#** - Introduction, Understanding the System.Threading Namespace, Creating and Starting a Thread, Scheduling a Thread, Synchronizing Threads, Threading Pooling. **Window Form and Web-based Application Development on .NET** – Introduction, Creating Window Form, Customizing a Form, Understanding Microsoft Visual Studio 2005, Creating and Running a SimpleWinApp Windows Application, Overview of Design Patterns, Creating and Running a SimpleWinApp2 Windows Application, Web-based Application Errors.

Text Book:

1. E. Balagurusamy, Programming in C#, McGraw-Hill.

Reference Books:

1. Rod Stephens, C# 5.0 – Programmer's Reference, WroxA Wiley Brand.
2. Rod Stephens, C# - 24 –Hour Trainer, Wrox A Wiley Brand.
3. Herbert Schildt, The Complete Reference C# 4.0, McGraw-Hill.

Practical List of C#.NET

1. Write an algorithm, draw a flowchart and develop a C#.Net console application to check whether the entered year is a leap year or not.

2. Write an algorithm, draw a flowchart and develop a C#.Net console application to develop Boxing and Unboxing concept.

3. Write an algorithm, draw a flowchart and develop a C#.Net console application to calculate the reverse of a number, To check the given number is palindrome or not, To check the given number is Armstrong or not, To calculate the sum of all the digits of a number.

4. Write an algorithm, draw a flowchart and develop a C#.Net console application to print the Following Pattern:

```
      1
    2   2
  3   3   3
4   4   4   4
```

5. Write an algorithm, draw a flowchart and develop a C#.Net console application to display the following pattern-

   Computer

Compute
Comput
Compu
Comp
Com
Co
C

6. Write an algorithm, draw a flowchart and develop a C#.Net console application to print the Pascal Triangle.

7. Write an algorithm, draw a flowchart and develop a C#.Net console application to perform ascending order sorting using Jagged Array.

8. Write an algorithm, draw a flowchart and develop a C#.Net console application to find out the largest and second largest number from an array using jagged array.

9. Write an algorithm, draw a flowchart and develop a C#.Net console application to print abbreviation form of Name.

10. Write an algorithm, draw a flowchart and develop a C#.Net console application to separate character, digit and special symbols from an alpha numeric string and display them in ascending order sorting.

11. Write an algorithm, draw a flowchart and develop a C#.Net console application to count number of characters, words and blank spaces of given sentence.

12. Write an algorithm, draw a flowchart and develop a C#.Net console application to withdraw, deposit & transfer money to the account using method overloading.

13. Write an algorithm, draw a flowchart and develop a C#.Net console application to overload unary operator '-' and perform subtraction operation.

14. Write an algorithm, draw a flowchart and develop a C#.Net console application to overload binary operator '+' and perform addition operation between two complex numbers.

15. Write an algorithm, draw a flowchart and develop a C#.Net console application to implement the concept of constructor overloading.

16. Write an algorithm, draw a flowchart and develop a C#.Net console application to implement the concept of hierarchical inheritance.

17. Write an algorithm, draw a flowchart and develop a C#.Net console application to implement the concept of interface.

18. Write an algorithm, draw a flowchart and develop a C#.Net console application to combine two delegates.

19. Write an algorithm, draw a flowchart and develop a C#.Net console application to display the priority of the thread.

20. Write an algorithm, draw a flowchart and develop a C#.Net console application to convert feet to inches using Delegates.
21. Write an algorithm, draw a flowchart and develop a C#.Net console application to copy the contents from one file to another file.

22. Develop a C#.Net windows application to design and develop a simple calculator.

23. Develop a C#.Net windows application to design and develop a simple Notepad.

24. Develop a C#.Net windows application to develop a Birthday Reminder programme.

25. Develop a C#.Net windows application to develop a Database Connectivity with all controls.

Paper - IV: Compulsory Foundation
Research Methodology(3T4)

UNIT – I

Research process, Problem and Hypothesis:

About Research - Introduction, Application of research, Definitions of research, Characteristics/Features of a good research, Types of research, Research Methods and Methodology, Research/Scientific Methods/Discovery, Research approaches, Application of research in management (Research applications in marketing management, Production management, Financial management, Human resource management, Current status of research in India), Limitations of research. **Research Process** - Defining and Formulating the Research Problem, Extensive Literature Survey, Development of the Working Hypothesis, Preparing the Research Designs, Determining the Sample Designs, Collecting the Data (Data Collection), Execution of the Project, Analysis of the Data, Hypothesis Testing and Verification, Generalization, Interpretation and drawing conclusions, Preparation of the report or writing the thesis. **Research Problem -** What is Research Problem?, Components of a research problem, Selection of a research problem, Technique involve in defining a research problem, Sources of problem, Research Proposal or Synopsis, Preparing synopsis for the research, Preparing research Plan. **Hypothesis -** Sources of hypothesis, Origin of hypothesis, Characteristics of a good hypothesis.

UNIT – II

Research Design and Sampling Design:

About Research Design - Introduction, Definition, Components of a research designs, Concepts related to research designs, Types of research designs. **Sampling Design –** Definition of sampling?, Features of the sampling technique, Essentials of an ideal sample, Types of sampling, Selecting/Calculating the sample size, Determination of sample size *n* When estimating the population mean, Some basic technologies of sampling, Common sampling distribution, Sampling theory.

UNIT – III

Data Collection, Preparation of Questionnaire and Schedule:

About Data Collection – Introduction, Primary data, Secondary data, Collection of primary data, Sources of secondary data, Creating a mechanism for gathering secondary data. **Questionnaire and Schedule –** Merits, Demerits, Formulation of Questionnaire, Various Method/ Technique for getting the Response, Construction of Questionnaire, Schedule, Types of Schedules, Difference between Questionnaire and Schedules, Types of Questions, Case Study Method.

UNIT – IV

Analysis of Data, Hypothesis Testing, Role of SPSS and Excel:

Analysis of Data -Introduction, Processing of data, Diagrammatic presentation in research, Scaling. **Role of Statistics -**Relational Statistics, Inferential Statistics(Inductive Statistics), Measures of Central Tendency, Types of central tendency or Average, Standard Deviation, Skewers, Correlation , Z-Test, t-Test or t-Distribution. **Research Hypothesis –** Introduction of Research hypothesis, The Rationale for Hypothesis Testing, A General Procedure for Hypothesis Testing, Steps Involved in Hypothesis Testing, Procedure for Testing Hypothesis, Two-Sides and One-Sided Tests. **Role of SPSS –** Introduction, The Variables view, Statistical Types in SPSS, The SPSS Interface, Running procedures from the Menus, SPSS output files.**Role of MS Excel -** Excel and Research, The Excel spreadsheet, The Spreadsheet - The Container, Parts of the Spreadsheet, Create a new File, Save a new file, Open an existing file, Close a file, Navigating the spreadsheet, A simple spreadsheet, Simple formulas, Insert row and columns, Sorting, Chart wizard, Using Excel to determine a confidence interval, Using Excel for t-test of hypothesis, The t-test for Dependent(and Matched-Pair) Samples, Using Excel for ANOVA, Using Excel for Correlation, Using Excel for Linear Regression, Using Excel for Chi-Square Tests.

Text Book:

1. MukulGupta ,Deepa Gupta, Research Methodology, PHI.

Reference Books:

1. Dr. C. R. Kothari, Research Methodology, New Age International (P Ltd) Publishers.
2. Dr. J. Y. Khan, Research Methodology, A. T. H. Publishing Corporation.
3. Dr. PrasantSarangi, Research Methodology, Taxmann‘s.
4. Briony J Oates, Researching Information Systems and Computing, SAGE Publications.
5. Uma Sekaran& Roger Bougie, Research Methods for Business, Wiley.
6. Dr. Vijay Upagade& Dr. ArvindShende, Research Methodology, S. Chand.

MCM Part-II

Semester - IV

Paper - I: ASP.Net (4T1)

UNIT – I

An introduction to ASP.NET programming: An introduction to web applications, An introduction to ASP.NET development. **How to develop a one-page web application:** How to work with ASP.NET web sites, How to use Visual Studio to build a web form, How to add validation controls to a form, How to add C# code to a form, How to test a web application. **How to use HTML5 and CSS3 with ASP.NET applications:** The Future Value application with CSS formatting, The HTML and CSS skills that you need. **How to develop a multi-page web application:** How to work with multi-page web sites, How to use session state. **How to test and debug ASP.NET applications:** How to test an ASP.NET web site, How to use the debugger, How to use the trace feature.

UNIT –II

How to use the standard server controls: How to use the common server controls, How to use the button controls, How to use the list controls. **How to use the validation controls:** Introduction to the validation controls, How to use the validators, Validation techniques. **How to work with state, cookies, and URL encoding:** How to use view state, How to use session state, How to use application state and caching, How to use cookies and URL encoding. **How to use master pages:** How to create master pages , How to create and develop content pages, How to customize content pages. **How to use themes:** An introduction to themes, How to work with themes and skins. **How to use site navigation and ASP.NET routing:** How to use the navigation controls, How to use ASP.NET routing, How to use the navigation controls with ASP.NET routing.

UNIT – III

An introduction to database programming: An introduction to relational databases, An introduction to ADO.NET 4.5, How to use the DataList control, How to use data binding, How to customize the GridView control, How to use the DetailsViewcontrol , How to use the FormView control. **How to use object data sources with ADO.NET:** An introduction to object data sources, How to create a data access class, A Category Maintenance application. **How to secure a web site:** An introduction to SSL, How to use a secure connection**. How to authenticate and authorize users:** An introduction to authentication, How to set up authentication and authorization, How to use the login controls. **How to use email, custom error pages, and back-button control:** How to send email, How to use custom error handling, How to handle the back-button problem.

UNIT – IV

How to configure and deploy ASP.NET applications: How to use the Web Site Administration Tool, An introduction to deployment, How to use one-click deployment, How to create and use a Setup program. **How to use ASP.NET Ajax:** An introduction to Ajax, An introduction to ASP.NET Ajax, How to use the ASP.NET Ajax server controls, An application that uses ASP.NET Ajax. **How to create and use WCF and Web API services:** An introduction to web services, How to create a WCF service, How to create

a web site that consumes a WCF service, How to create a Web API service, How to create a web site that consumes a Web API service. **An introduction to ASP.NET MVC:** An introduction to MVC, An introduction to ASP.NET MVC, How to work with views, How to work with controls and postbacks.

Text Book:

1. Mary Delamater & Anne Boehm, murach's ASP.Net Web Programming with C#, Shroff Publishers.

Reference Books:

1. ASP.Net Black Book, Kogent Learning Solutions Inc, Dreamtech Press.
2. Jason Gaylord, Christian Wenz, PranavRastogi, Todd Miranda, Scott Hanselman, Professional ASP.Net in C# & VB, Wrox A Wiley Brand.
3. ASP.Net with C#, Kogent Learning Solutions Inc, Dreamtech Press.

Practical List of ASP.NET

1. Create a page in ASP.NET using VB.NET or C# to display the following Web Controls:
   1. A button with text "click me". The button control must be in the center of the form.
   2. A label with a text hello
   3. A checkbox. The form name must be Web Controls.

2. Create a page in ASP.NET using VB.NET or C# that displays a button in green color and it should change into yellow when the mouse moves over it.

3. Create a page in ASP.NET using VB.NET or C# containing the following controls:
   1. A ListBox
   2. A Button
   3. An Image
   4. A Label

   The listbox is used to list items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button,the cost of the selected item is displayed in the control.

4. Create a page in ASP.NET using VB.NET or C# that take a student name from the user, add that name in list-box control. And delete the chosen name from the list-box.

5. Create a page in ASP.NET using VB.NET or C# for book sales. Enter the quantity, title and price of the book. Calculate the extended price, discount (15%) and after discount, the actual price of the book. Show the summery of book sales. (Like total no of books, total discount given, total discounted amount and average discount.) You will need command buttons- calculate, clear sale.

6. Create a page in ASP.NET using VB.NET or C# using HTML Server controls that take user name, address, and city, state and country name from the user and display it.

7. Create a page in ASP.NET using VB.NET or C# using HTML Server controls that convert given currency into another selected currency. For that you need a drop-down-list.

8. Create a page in ASP.NET using VB.NET or C# to get a user input such as the boiling point of water and test it to the appropriate value using Compare Validator.

9. Create a page in ASP.NET using VB.NET or C# that uses a textbox for a user input name and validate it for RequiredField Validation.

10. Create a page in ASP.NET using VB.NET or C# that gets user input such as the user name, mode of payment, appropriate credit card. After the user enters the appropriate values the Validation button must validates the values entered.

11. Create a page in ASP.NET using VB.NET or C# to declare one TextBox control, one Button control, one Label control, and one RegularExpressionValidator control in an .aspx file. The submit() function checks if the page is valid. If it is valid, it returns "The page is valid!" in the Label control. If it is not valid, it returns "The page is not valid!" in the Label control. If validation fails, the text "The zip code must be 5 numeric digits!" will be displayed in the RegularExpressionValidator control.

12. Create a page in ASP.NET using VB.NET or C# to the database with ADO.NET for Inserting Data.

13. Create a page in ASP.NET using VB.NET or C# to the database with ADO.NET for Updating Data.

14. Create a page in ASP.NET using VB.NET or C# to the database with ADO.NET for Deleting Data.

15. Create a page in ASP.NET using VB.NET or C# to the database with ADO.NET for Search Data.

16. Create a page in ASP.NET using VB.NET or C# that contains a list of following technologies:
    - ASP.NET, ADO.NET, C#.
    - It also contains a textbox in which the user has to enter a name and a textarea in which the user has to enter his comments. When the Submit is clicked, the output should display the name entered in the textbox and the user-selection from the listbox. All the above should be displayed with the tracing for the page being enabled.

17. Create a page in ASP.NET using VB.NET or C# that generates the "IndexOutOfRange" exception when a button is clicked. Instead of displaying the above exception, it redirects the user to a custom error page. All the above should be done with the trace for the page being enabled.

18. Create a page in ASP.NET using VB.NET or C# to create a simple Web Service that converts the temperature from Fahrenheit to Celsius, and vice versa create a simple Web Service that converts the temperature from Fahrenheit to Celsius, and vice versa. Also write an ASP program to consume this web service.

19. Create a page in ASP.NET using VB.NET or C# to create a proxy.

20. Create a page in ASP.NET using VB.NET or C# that has a form taking the user‟s name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie‟s content.

21. Create a page in ASP.NET using VB.NET or C# to create a Session dictionary using object tag. In session-on start add keys for Time, UserAgent, RemoteIP& add appropriate values. Create a simple page to display the values.

22. Create a page in ASP.NET using VB.NET or C# to implement Session tracking using user authentication.

23. Create a page in ASP.NET using VB.NET or C# to delete all cookies of your web site that has created on the client's computer.

24. Create a page in ASP.NET using VB.NET or C# to run video.

25. Create a page in ASP.NET using VB.NET or C# forDynamic images uploading by the user using FileUpload control and setting the profile image by the user in a website.

Paper - II: Elective
Elective – I: Advance Java (4T2)

UNIT - I

Introducing Swing – JFC, The MVC Architecture, Applet, Window Panes, Important Classes of the javax.swing Package, Setting the Look and Feel of Components, An Applet with Swing Components. **Working with JDBC** - Introducing JDBC, Exploring JDBC Drivers, Exploring the Features of JDBC, Describing JDBC APIs, Exploring Major Classes and Interfaces, Exploring JDBC Processes with the java.sql Package, Working with Transactions. **Network Programming -**Networking Basics, Network Programming in Java Using the java.net Package, Establishing the two-way Communication between Server and Client, Retrieving a file at server, Learning the DatagramSocket and DatagramPacket Classes, Understanding the Content and Protocol Handlers.

UNIT - II

RMI, Naming Service, Serialization, and Internationalization - RMI Architecture, RMI Registry, Dynamic Code Loading in RMI, RMI API, Creating a Distributed Application, using RMI, Naming Services, Directory and Naming Services, Overview of JNDI, Object Serialization, Internationalization, Java and Internationalization, Internationalizing Web Applications. **Introducing the Java EE Platform** - Enterprise Application Concepts, Introducing the Java EE 6 Platform, HTTP Protocol, Exploring Web Application, Introducing Web and Application Servers. **Working with Servlets** - Exploring the Features of Java Servlet, Exploring New Features in Servlet 3.0, Exploring the Servlet API, Explaining the Servlet Life Cycle, Understanding Servlet Configuration, Creating a Sample Servlet, Creating a Servlet by using Annotation, Working with ServletConfig and ServletContext Objects, Working with the HttpServletRequest and HttpServletResponse Interfaces, Exploring Request Delegation and Request Scope, Describing a Session, Introducing Session Tracking, Exploring the Session Tracking Mechanisms, Using the Java Servlet API for Session Tracking.

UNIT - III

Introducing Event Handling and Filters - Introducing Events, Intoducing Event Handling, Working with the Types of Servlet Events, Introducing Filters, Exploring Filter API, Configuring a Filter, Creating a Web Application Using Filters, Using Initializing Parameter in Filters, Manipulating Responses, Discussing Issues in Using Threads with Filters. **Working with JavaServer Pages (JSP)** - Introducing JSP Technology, Exploring New Features of JSP 2.1, Listing Advantages of JSP over Java Servlet, Exploring the Architecture of a JSP Page, Describing the Life Cycle of a JSP Page, Working with JSP Basic Tags and Implicit Objects, Working with Action Tags in JSP, Exploring the JSP Unified EL, Using Functions with EL.

UNIT - IV

JSP Tag Extensions and Standard Tag Library - Exploring the Elements of Tag Extensions, Exploring the Tag Extension API, Working with Classic Tag Handlers, Working with Simple Tag Handlers, Working with JSP Fragments, Working with Tag Files, Introducing JSTL, Working with the Core Tag Library, Working with the XML Tag Library, Working with the Internationalization Tag Library, Working with the SQL Tag Library, Working with the Functions Tag Library. **Introducing Hibernate** - Introducing Hibernate, Exploring the Architecture of Hibernate, Downloading Hibernate, Exploring HQL, Understanding Hibernate O/R Mapping, Working with Hibernate, Implementing O/R Mapping with Hibernate.

Text Book:

1. Prof. M. T. Savaliya, Advance java Technology, Dreamtech Press.

Reference Books:

1. Dr. Ashwin Mehta, Sarika Shah, Advance Java for Students, Shroff Publishers.
2. Patrick Naughton& Herbert Schildt, The Complete Reference: Java 2, McGraw-Hill.
3. Joseph Weber, Using Java 2 Platform, Prentice Hall of India.
4. Uttam K. Roy, Advance Java Programming, Oxford University.
5. KanikaLakhani, Advance Java Programming, Katson Books.

Practical List of Advance Java

1. Write a Java program to develop an applet that draws a circle. The dimension of the applet should be 500 x 300 pixels. The circle should be centered in the applet and have a radius of 100 pixels. Display your name centered in a circle.(using drawOval() method).

2. Write a Java program to draw ten red circles in a vertical column in the center of the applet.

3. Write a Java programto developcalculator using Swing and also add image on Button.

4. Write a Java program to find the IP address or computer name of local machine.

5. Write a Java program with class GreetingClient is a client program that connects to a server by using a socket and sends a greeting, and then waits for a response.

6. Write a Java program that implements a simple client/server application.The client sends data to a server the server receives the data,uses it to produce a result and then sends the result back to the client.The client displays the result on the console. For ex the data send from the client is a numbers and the result produce by the server is the addition of that number.

7. Write a Java program to create an application that displays a frame with a menu bar. When a user selects any menu or menu item, display that selection on a text area in the center of the frame.

8. Write RMI application where client supplies data to withdraw and server response with new account balance. Provide your custom security policy for this application.

9. Write a Java program to developdatabase application that allows user to Insert, Update, Delete values in a Table and manages appropriate exception handling when wrong values are entered.

10. Write a Java program to present a set of choice for user to select a product and display the price of product.

11. Write a Java program to show validation of user using servlet.

12. Write a Java program to develop a simple servlet question answer application.

13. Write a Java program to pass any URL string and display all 4 elements of URL string.

14. Write a Java program to trap all the events of mouse listener interface.

15. Write a Java program to show validation of user using JSP.

16. Write a Java program to display message on browser using JSP.

17. Write a Java program to connect with the google.com and retrieve the html code of default web page.

18. Write a Java program to present a set of choices for a user to select stationary products and display the price of product after selection from the list.

19. Write a Java program to demonstrate typical editable table, describing employee details for a software company.

20. Write a Java program to trap all the events of key listener interface.

21. Write a Java program of calling one servlet by another servlet.

22. Write a Java program to develop a simple servlet calculator application.

23. Write a Java program to set scope of beans.

24. Write a Java program to create a JSP application that accepts registration details from the student and stores the details into the database table.

25. Write a Java program to develop a JSP application that authenticate user login as per the registration details. If login success then forward user to the index page otherwise show login failure message.

26. Write a Java program using split pane to demonstrate a screen divided into two parts contains a name of planets and another display the image of planet. When user selects the planet name from the left screen appropriate image of display in right screen.

27. Write a Java program to develop a web application to add items in the inventory using JSP.

28. Write a Java program to create a web form which processes servlet and demonstrates use of cookies and sessions.

29. Write a Java program to develop a simple JSP program for user login form with static and dynamic database.

30. Write a Java program to develop a JSP program to display the grade of a student by accepting the marks of five subjects.

Paper - II: Elective
Elective – II: Android Programming (4T2)

UNIT - I

Getting an Overview of Android Introducing Android -Listing the Version History of Android Platform, Discussing Android APIs, Describing the Android Architecture Application Framework, Exploring the Features of Android, Discussing about Android Applications, The Application Components, The Manifest File, The Command-Line Tools, Developing and Executing the First Android Application, Using Eclipse IDE to Create an Application, Running Your Application, Exploring the Application, Using Command-Line Tools. **Using Activities, Fragments and Intents in Android -**Working with Activities, Creating an Activity, Starting an Activity, Managing the Lifecycle of an Activity, Applying Themes and Styles to an Activity, Displaying a Dialog in the Activity, Hiding the Title of the Activity, Using Intents, Exploring Intent Objects, Exploring Intent Resolution, Exploring Intent Filters, Resolving Intent Filter Collision, Linking the Activities Using Intent, Fragments, Fragment Implementation, Finding Fragments, Adding, Removing, and Replacing Fragments, Finding Activity Using Fragment, Using the Intent Object to Invoke Built-in Application. **Working with the User Interface Using Views and ViewGroups -**Working with View Groups, The LinearLayout Layout, The RelativeLayout Layout, The ScrollView Layout, The TableLayout Layout, The FrameLayout Layout, The TabLayout Using the Action Bar, Working with Views, Using the TextView, Using the EditText View, Using the Button View, Using the RadioButton View, Using the CheckBox View, Using the ImageButton View, Using the ToggleButton View, Using the RatingBar View, Binding Data with the AdapterView Class, Using the ListView Class, Spinner, Using the Gallery View, Designing the AutoTextCompleteView, Implementing Screen Orientation, Anchoring the Views of the Current Activity, Customizing the Size and Position of the Views, Designing the Views Programmatically, Handling UI Events, Handling User Interaction with Activities, Handling User Interaction with the Views, Specialized Fragments, ListFragment, DialogFragment, PreferenceFragment, Creating Menus The Options Menu The Context Menu The SubMenus.

UNIT - II

Handling Pictures and Menus with Views -Working with Image Views, Displaying Images in the Gallery View, Displaying Images in the Grid View, Using the ImageSwitcher View, Designing Context Menu for Image View, Using the AnalogClock and DigitalClock Views, Embedding Web Browser in an Activity, Notifying the User Creating the Toast Notification, Creating the Status Bar Notification, Creating the Dialog Notification. **Storing the Data Persistently -**Introducing the Data Storage Options, Using Preferences, Using the Internal Storage Exploring the Methods Used for Internal Storage, Developing an Application to Save User Data Persistently in File, Using the External Storage Exploring the Methods Used for External Storage, Developing Application to Save File in SD Card, Using the SQLite Database Creating the Database Helper Class, Creating the Layout and Main Activity Class, Creating the Layout and Activity for the Insert Operation, Creating the Layout and Activity to Search a Record, Creating the Activity Class to Fetch All Records, Creating the Layout and Activity for the Update Operation, Creating the Layout and Activity for the Delete Operation, Executing the Database Operations, Working with Content Providers, Exploring the android.provider Package, Creating User-Defined Content Provider, Consuming User-Defined Content Provider. **Emailing and Networking in Android -**Building an Application to Send Email, Networking in Android, Getting an Overview of Networking Fundamentals, Checking Network Availability, Accessing Web Services Using HTTP

Post, Accessing Web Services Using the GET Method, Working with Binary Data and Text Files, Consuming JSON Services, Sockets Programming.

UNIT - III

Working with Location Services and Maps - Working with Google Maps, Exploring Google Maps External Library, Creating an Application Using Google Maps Android API, Disabling the Zoom Control Button, Changing the Map Type, Displaying the Specific Location and Adding Markers, Handling Map Gestures Interaction, Getting the Current Location of a User, Working with Geocoding and Reverse Geocoding. **Working with Graphics and Animation -**Working with Graphics, Drawing Graphics to Canvas, Using the Drawable Object, Referencing an Image File, Defining Drawable in XML, Using the Shape Drawable Object, Working with the Nine Patch Drawable Graphics, Understanding the Concept of Hardware Acceleration, Working with Animations, The Property Animation, View Animation Drawable Animation. Audio, Video and Camera - Role of Media Playback Using Media Player Media Formats Supported by Media Player, Preparing Audio for Playback, Preparing Video for Playback, Creating Application to Play Audio and Video Using MediaPlayer, Recording and Playing Sound, Use of Media Store Audio Recording Application, Creating a Sound Pool Using Camera for Taking Pictures, Creating Video Recording Application.

UNIT - IV

Threads and Services -Introducing Threads Worker Threads Using AsyncTask, Introducing Services Exploring Services Essentials, Understanding the Lifecycle of a Service, Exploring the Service Class, Introducing the Service Class, Creating a Bound Service. **Bluetooth, NFC and Wi-Fi -**Working with Bluetooth Exploring the Android Bluetooth APIs, Permissions Required to Access Bluetooth, Setting Up the Bluetooth for an Application, Identifying the Bluetooth-Enabled Devices, Querying the Paired Devices, Discovering Devices Creating an Application Using Bluetooth Functionality, Connecting the Devices Using Bluetooth for Data Transfer, Connecting as a Server Connecting as a Client Working with Bluetooth Low Energy, Working with NFC, Exploring the Basics of NFC, Developing an Application Using NFC, Working with Wi-Fi, Exploring the Wi-Fi APIs, Creating an Application Using Wi-Fi. **Telephony and SMS -**Handling Telephony Displaying Phone Information Application Receiving Phone Calls Application, Making Outgoing Phone Calls Application, Handling SMS Sending SMS Using SmsManager, Sending SMS Using Intent, Receiving SMS Using the BroadcastReceiver Object, Role of Default SMS Providers. Hardware Sensors - Introducing Sensors Exploring the Sensor Framework, Managing Various Sensor Configurations, Understanding the Sensor Coordinate System.

Text Book:

1. Rradeep Kothari, Android Application Development – Black Book, Dreamtech Press.

Reference Books:

1. Prasanna Kumar Dixit, Android, Vikas Publishing.
2. Dawn Griffiths & David Griffiths, Head First Android Development, Shroff Publishers.
3. Ed Burnette, Hello Android, Shroff Publishers.
4. Jerome DiMarzio, Android – A Programmer's Guide, McGraw-Hill.
5. Dave MacLean, SatyaKomatineni, Grant Allen, Pro Android 5, Apress.
6. Reto Meier, Professional Android Application Development, Wiley.

Practical List of Android Programming

1. Create “Hello World” android application. That will display “Hello World” in the middle of the screen in the red color with white background.

2. Write an android application to understand Activity, Intenta. Create sample application with login module.(Check username and password) and on successful login, go to next screen. And on failing login, alert user using Toast.Also pass username to next screen.

3. Create an android application that will change color of the screen and change the font size of text view using xml.

4. Create login android application where you will have to validate EmailID(UserName). Till the username and password is not validated, login button should remain disabled.

5. Create and login android application as above. On successful login, open browser with any URL.

6. Create an android application that will pass some number to the next screen, and on the next screen that number of items should be display in the list.

7. Create an android application that will change color of the screen, based on selected options from the menu.

8. Create an android application that will display toast(Message) on specific interval of time.

9. Create aandroid background application that will open activity on specific time.

10. Create an android application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.

11. Create an android UI such that, one screen have list of all the types of cars.andon selecting of any car name, next screen should show Car details like : name , launched date ,company name, images(using gallery) if available, show different colors in which it is available.

12. Write an android application to read phonebook contacts using content providers and display in list.

13. Write an android application to read messages from the mobile and display it on the screen.

14. Create an android application to call specific entered number by user in the EditText.

15. Create an android application that will create database with table of User credential.
16. Create an android application to read file from asset folder and copy it in memory card.

17. Create an android application that will play a media file from the memory card.

18. Create an android application to make Insert,update, Delete and retrieve operation on the database.

19. Create an android application to read file from the sdcard and display that file content to the screen.

20. Create an android application to draw line on the screen as user drag his finger.

21. Create an android application to send message between two emulators.

22. Create an android application to take picture using native application.

23. Create an android application to pick up any image from the native application gallery and display it on the screen.

24. Create an android application to open any URL inside the application and clicking on any link from that URl should not open Native browser but that URL should open the same screen.

25. Create an android application that will create database with table of User credential.

Paper - II: Elective
Elective – III: Python (4T2)

UNIT - I

The Way of the Program - The Python Programming Language, What Is a Program?,What Is Debugging?, Syntax Errors, Runtime Errors, Semantic Errors, Experimental Debugging, Formal and Natural Languages, The First Program. **Variables, Expressions, and Statements -** Values and Types, Variables, Variable Names and Keywords, Operators and Operands, Expressions and Statements, Interactive Mode and Script Mode, Order of Operations, String Operations, Comments.**Functions -** Function Calls, Type Conversion Functions, Math Functions, Composition, Adding New Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Variables and Parameters Are Local, Stack Diagrams, Fruitful Functions and Void Functions, Why Functions?, Importing with from.

UNIT - II

Conditionals and Recursion - Modulus Operator, Boolean Expressions, Logical Operators, Conditional Execution, Alternative Execution, Chained Conditionals, Nested Conditionals, Recursion, Stack Diagrams for Recursive Functions, Infinite Recursion, Keyboard Input. **Fruitful Functions -** Return Values, Incremental Development, Composition, Boolean Functions, More Recursion, Leap of Faith, One More Example, Checking Types. **Iteration -** Multiple Assignment, Updating Variables, The while Statement, break, Square Roots, Algorithms, Debugging. **Strings -** A String Is a Sequence, len, Traversal with a for Loop, String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The in Operator, String Comparison.

UNIT - III

Lists - A List Is a Sequence, Lists Are Mutable, Traversing a List, List Operations, List Slices, List Methods, Map, Filter, and Reduce, Deleting Elements, Lists and Strings, Objects and Values, Aliasing, List Arguments. **Dictionaries -** Dictionary as a Set of

Counters, Looping and Dictionaries, Reverse Lookup, Dictionaries and Lists, Memos, Global Variables, Long Integers.**Tuples -** Tuples Are Immutable, Tuple Assignment, Tuples as Return Values, Variable-Length Argument Tuples, Lists and Tuples, Dictionaries and Tuples, Comparing Tuples, Sequences of Sequences.

UNIT - IV

Files – Persistence, Reading and Writing, Format Operator, Filenames and Paths, Catching Exceptions, Databases, Pickling, Pipes, Writing Modules.**Classes and Objects -** User-Defined Types, Attributes, Rectangles, Instances as Return Values, Objects Are Mutable, Copying. **Classes and Functions –** Time, Pure Functions, Modifiers, Prototyping versus Planning.**Classes and Methods -** Object-Oriented Features, Printing Objects, Another Example, A More Complicated Example, The init Method, The __str__ Method, Operator Overloading, Type-Based Dispatch, Polymorphism, Debugging, Interface and Implementation. **Inheritance -** Card Objects, Class Attributes, Comparing Cards, Decks, Printing the Deck, Add, Remove, Shuffle, and Sort, Inheritance, Class Diagrams, Debugging, Data Encapsulation.

Text Book:

1. Allen B. Downey, Think Python, Shroff Publishers, O'Reilly.

Reference Books:

1. Charles Dierbach, Introduction to Computer Science using Python, Wiley.
2. Laura Cassell& Alan Gauld, Python Projects, Wrox A Wiley Brand.
3. Paul Greis, Jennifer Campbell, Jason Montojo, Practical Programming – An Introduction to Computer Science using Python, Shroff Publishers.

Practical List of Python

1. Write a Python program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.

2. Write a Python program that allows the user to enter any integer base and integer exponent, and displays the value of the base raised to that exponent.

3. Write a Python program that prompts the user for a certain number of cities for the Travelling salesman Problem, and displays the total number of possible routes that can be taken.

4. Write a Python program that prompts the user to enter an upper or lower case letter and displays the corresponding Unicode encoding.

5. Write a Python programto calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
   Grade A: Percentage >=80
   Grade B: Percentage>=70 and <80
   Grade C: Percentage>=60 and <70
   Grade D: Percentage>=40 and <60
   Grade E: Percentage<40
6. Write a Python program to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user using user-defined function.

7. Write a Python program find factorial of the given number.

8. Write a Python program to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - n/n!

9. Write a Python program to calculate the sum and product of two compatible matrices.

10. Write a Python program to calculate the transpose of a matrix.

11. Write a Python program to determine how many times a given letter occurs in a provided string using recursion.

12. Write a Python program to calculate Fibonacci series using recursion.
    Visual Python.

13. Write a Python program to create mathematical 3D objects –
    I. curve
    II. sphere
    III. cone
    IV. arrow
    V. ring
    VI. cylinder.

14. Write a Python program to read n integers and display them as a histogram.

15. Write a Python program to display sine, cosine, polynomial and exponential curves.

16. Write a Python program to plot a graph of people with pulse rate p vs. height h. The values of P and H are to be entered by the user.

17. Write a Python program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula m=60/(t+2), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.

18. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:
    P(t) = (15000(1+t))/(15+ e)
    where the time t is measured in hours. Write a Python program to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.

19. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
    I. velocity wrt time (v=u+at)
    II. distancewrt time (s=u*t+0.5*a*t*t)
    III. distancewrt velocity (s=(v*v-u*u)/2*a)

20. Write a Python program show a ball bouncing between 2 walls.

Paper - III: Elective Foundation
Elective Foundation – I: Big Data&Hadoop (4T3)

UNIT - I

Types of Digital Data -Classification of Digital Data.**Introduction to Big Data -** Characteristics of Data, Evolution of Big Data, Definition of Big Data, Challenges with Big Data, What is Big Data?, Other Characteristics of Data Which are not Definitional Traits of Big Data, Why Big Data?, Are We Just an Information Consumer or Do we also Produce Information?, Traditional Business Intelligence (BI) versus Big Data, A Typical

Data Warehouse Environment, A Typical Hadoop Environment, What is New Today?, What is changing in the Realms of Big Data?. **Big Data Analytics -**Where do we Begin?, What is Big Data Analytics?, What Big Data Analytics Isn't?, Why this Sudden Hype Around Big Data Analytics?, Classification of Analytics, Greatest Challenges that Prevent Businesses from Capitalizing on Big Data, Top Challenges Facing Big Data, Why is Big Data Analytics Important?, What Kind of Technologies are we looking Toward to Help Meet the Challenges Posed by Big Data?, Data Science, Data Scientist…Your New Best Friend!!!, Terminologies Used in Big Data Environments, Basically Available Soft State Eventual Consistency (BASE), Few Top Analytics Tools.

UNIT - II

The Big Data Technology Landscape -NoSQL (Not Only SQL), Hadoop.**Introduction to Hadoop -**Introducing Hadoop, Why Hadoop?, Why not RDBMS?, RDBMS versus Hadoop, Distributed Computing Challenges, History of Hadoop, Hadoop Overview, Use Case of Hadoop, Hadoop Distributors, HDFS (Hadoop Distributed File System), Processing Data with Hadoop, Managing Resources and Applications with Hadoop YARN (Yet another Resource Negotiator), Interacting with Hadoop Ecosystem. **Introduction to MongoDB -**What is MongoDB?,Why MongoDB?, Terms Used in RDBMS and MongoDB, Data Types in MongoDB, MongoDB Query Language.

UNIT - III

Introduction to Cassandra - Apache Cassandra - An Introduction, Features of Cassandra, CQL Data Types, CQLSH, Keyspaces, CRUD (Create, Read, Update and Delete) Operations, Collections, Using a Counter, Time to Live (TTL), Alter Commands, Import and Export, Querying System Tables, Practice Examples. Introduction to MAPREDUCE Programming – Introduction, Mapper, Reducer, Combiner, Partitioner, Searching, Sorting, Compression. Introduction to Hive - What is Hive?, Hive Architecture, Hive Data Types, Hive File Format, Hive Query Language (HQL), RCFile Implementation, SerDe, User-Defined Function (UDF).

UNIT - IV

Introduction to Pig - What is Pig?, The Anatomy of Pig, Pig on Hadoop, Pig Philosophy, Use Case for Pig: ETL Processing, Pig Latin Overview, Data Types in Pig, Running Pig 10.9 Execution Modes of Pig, HDFS Commands, Relational Operators, Eval Function, Complex Data Types, Piggy Bank, User-Defined Functions (UDF), Parameter Substitution, Diagnostic Operator, Word Count Example using Pig, When to use Pig?, When not to use Pig?, Pig at Yahoo!, Pig versus Hive. Jasper Report using Jasper soft - Introduction to Jasper Reports, Connecting to MongoDBNoSQL Database, Connecting to Cassandra NoSQL Database. Introduction to Machine Learning - Introduction to Machine Learning, Machine Learning Algorithms.

Text Book:

1. SeemaAcharya&SubhashiniChellappan, Big data and Analytics, Wiley.

Reference Books:

1. RadhaShankarmani& M. Vijayalakshmi, Big data Analytics, Wiley.
2. Chuck Lam, Hadoop in Action, Dreamtech Press.
3. Philip Kromer& Russell Jurney, Big Data for Chimps, Shroff Publishers, O'Reilly.
4. ChandrakantNaikodi, Managing Big Data, Vikas publishing.
5. Chriss Eaton, DirikDeroos, Tom Deutsch, George Lapis, Paul Zikopoulos, Understanding Big Data, McGraw-Hill.

Paper - III: Elective Foundation
Elective Foundation – II: Software Engineering (4T3)

UNIT - I

Introduction- The software engineering discipline evolution and impact, Programs Vs. software product, Why study software engineering?, Emergence of software engineering, Notable changes in software development practices, Computer systems engineering. **Software Life Cycle-** Why use a life cycle model?, Classical waterfall model, Interactive waterfall model, Prototyping model, Evolutionary model, Spiral model, Comparison of different life cycle models. **Software Product Management**- Responsibilities of a software project manager, Project planning, Matrices for project size estimation, Project estimation techniques, Empirical project techniques, COCOMO- A heuristic estimation technique, Halstead's software science- An analytical technique, Staffing level estimation, Scheduling, Organization and team structures, Staffing, Risk management, Software configuration management, Miscellaneous plans.

UNIT - II

Requirement Analysis and Specifications - Requirement gathering and specifications, Software requirement specification, Formal system development techniques, Axiomatic specification, Algebraic specification, Executable specification and 4GLs. **Software Design**- What is a software design?, Cohesion and coupling, Neat arrangement, Software design approaches, Object oriented Vs. function oriented design. **Function Oriented Software Design**- Overview of SA/SD methodology, Structured analysis, Data flow diagrams (DFDs), Extending DFD techniques to real-time systems, Structured design, Detailed design, Design review.

UNIT - III

Object Modeling Using UML - Overview of object oriented concept, Unified modeling language (UML), UML diagrams, Use case models, Class diagrams, Interaction diagrams, Activity diagrams, State chart diagrams. **Object Oriented Software Development-** Design pattern, A generalized object oriented analysis and design process, Odd goodness criteria.

UNIT - IV

Computer Aided Software Engineering- Case and its scope, Case environment, Case support in software life cycle, Other characteristics of case tools, Towards second generation case tools, Architecture of a case environment. **Software Maintenance-** Characteristics of software maintenance, Software reverse engineering, Software maintenance process model, Estimation of maintenance cost. **Software Reuse**- What can be reused?, Why almost no reuse so far?, Basic issue in any reuse program, A reuse approach, Reuse at organization level.

Text Book:

1. Rajib Mall, Fundamentals of Software Engineering, PHI.

Reference Books:

1. Rajesh Narang, Software EngineeringPrinciples & Practices, McGraw-Hill.
2. Roger Pressman, Software Engineering – A Practitioner Approach, McGraw-Hill.
3. Dr. Sajan Mathew, Software Engineering, S. Chand.
4. S. Thangasamy, Essentials of Software Engineering, Wiley-India.
5. PankajJalote, Software Engineering – A Precise approach, Wiley.

Paper - III: Elective Foundation
Elective Foundation – III: Strategic Management (4T3)

UNIT - I

Strategic Management - Introduction to strategic management, Strategic decision making, Strategic management process; Difference between Policy, Strategy and Tactics. Vision, Mission & goals, Preparation of Vision & Mission Statement; Organizational objectives, Hierarchy of objectives & strategies, setting of Objectives.

UNIT - II

Internal & Resource Analysis - SWOT analysis, Resource analysis- a) Organization capabilities & competitive advantage b) Value chain analysis; Concept of synergy – Core competency, Competitive analysis - Interpreting the five forces model, Competitors analysis.**External analysis -** Environment analysis a) Components of External environment b) Components of Internal environment c) Environmental scanning. Industry Analysis a) A Framework for industry analysis b) Michael Porter's Analysis c) Usefulness of industry analysis.

UNIT - III

Strategy Formulation - Corporate Level Strategy: A) Growth-Concentration, Horizontal, Vertical, B) Diversification- Concentric, conglomerate. C) Expansion through Cooperation; Merger, Acquisitions, Joint ventures & strategic alliances D) Stability - Pause/proceed with caution, No change, Profit strategies. E) Retrenchment – Turnaround, Captive Company Strategy, Selling out Bankruptcy, Liquidation. **Portfolio Approach & Analysis -** a) Portfolio analysis, advantages & disadvantages, b) BCG Matrix c) General Electric's Business Screen, d) Life cycle or Arthur D Little matrix, e) Balance scorecard. 7s Framework, Strategic Business Unit (SBUS), Merits & Demerits of SBU; Leadership, Power & organization culture.

UNIT - IV

Business Level Strategy & Functional Level Strategy - A) Business Level strategy- Competitive advantage, Low cost strategy, Differential strategy and Focus strategy, B) Functional level strategy - Operations strategy, Marketing strategy, Financial strategy, Human Resource strategy. Global strategy **-** Reasons for globalization, Global expansion strategy, International Portfolio Analysis; Market entry strategy, International strategy & competitive advantage.

Strategic Implementation Strategic Evaluation, Control & Continuous:
Improvement - Establishing strategic evaluation & control; The quality imperative: continuous Improvement to build customer value, Fundamentals of Six sigma approach for continuous improvement.

Text Book:

1. V. S. Ramaswami, S. Namaumari, Strategic Planning & Formulation of Corporate Strategy, Macmillan - Publication.

Reference Books:

1. Richard B Robinson, Strategic Management, McGraw-Hill.
2. Henry, Understanding Strategic Management, Oxford University Press.
3. R.M. Srivastava, Management Policy & Strategic Management, Himalaya Pub.
4. Chandrasekara, Anant Narayanan, Strategic Management, Oxford University Press.

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